The American Journal of Pharmaceutical Education

THE OFFICIAL PUBLICATION OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

Giving [illegible] brave and true
Inspiring [illegible] sight,
Those [illegible] for the cause
Of Liberty and Right.

Let Peace [illegible] proper time,
Nor let [illegible] done,
Until the [illegible] decent men
Its victory [illegible]

And then [illegible] with punishment
That [illegible] minds
When bad men hang from willing trees
And swing in willing winds.

Then let the [illegible] of All
Proceed on [illegible] good plan
A world [illegible] for decency
The Parliament of Man!

—Ivor Griffith

Volume VII January, 1943 Number 1

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The President's Page

The New Year begins with the future place of the colleges of pharmacy in the war effort still uncertain. As I write this we are "waiting for action." All too typical of wartime, this waiting tries one's patience whether he is in the armed forces at the battle front or is a civilian with numerous responsibilities in his profession on the home front.

Whatever may be the answer to our question of how our colleges may best serve, you may be sure that a great effort has been made to present effectively our offer of service. Dean Kendig, with other members of the Committee on the Status of Pharmacy in the Government Service, has worked unceasingly; Dean DuMez, with members of the War Emergency Advisory Committee, has been spending not hours but days in Washington in order that our offer of service might be accompanied by full information on the present status of pharmaceutical education. Statistics have been compiled by Dean Rogers, Chairman of the Executive Committee, and made available to these committees in their work. In other words, our Association is "on the job."

In the midst of the many declarations of educators, editors and others who cannot seem to look on war as a temporary affliction, the recently reported statement of President Karl T. Compton of the Massachusetts Institute of Technology is refreshing. He said, "While the speeded-up, intensified programs of education are necessary in wartime, I do not think that in the long run it is the best scheme to have things crammed in too fast without giving students time to digest them. I believe that as soon as the war is over we should return quickly to programs of four years of study with summer vacations."

Many of us doubtless agree with President Compton. Even now when we are occupied with plans based on expediency in the present emergency, perhaps it is not too soon to begin giving some thought to post-war plans of operation based on the principles of education.

Howard C. Newton

Why Study the History of One's Profession?*

WARREN E. HOWLAND
Purdue University, Department of Engineering

"The teacher called on little Quentin,
Quentin, she questioned, who discovered America?
Quentin shrugged his shoulders.
What's the difference, he countered, as long as it's here!"

My approach to the subject of this evening's paper is that of the teacher trying to answer similar questions which might be directed against the History of My Profession; but—more than that—trying to discover how the subject might serve in broadening, deepening, and enriching professional education.

My own profession, engineering, and I believe the same is true also of pharmacy, is usually taught, even in institutions of the highest reputation, in a closely packed four-year curriculum, with no required preliminary college training. One frequently hears that this period of training should be lengthened or that preliminary junior college work should be required; that otherwise we cannot expect to give our graduates an intelligent, well-rounded understanding of modern civilization so that they may lead our industrial society in the direction it should go.

Whatever one's opinion may be regarding the advisability or probability of lengthening the curriculum, I think he would be likely to agree with me that such time as is now provided in the usual curriculum for non-technical studies should not be diminished but should be exceedingly well spent for the purpose intended.

I feel sure that the present practice of requiring a few conventional courses in English composition and in economics and then allowing the student to choose his other non-technical subjects from a large group of unrelated courses is not the best way to handle this vital part of the educational program. It is like trying to outfit a polar expedition by making a few off-hand purchases in a bargain basement.

In looking for a better plan it occurred to me that the History of Our Profession could be developed and taught in such

*Read at the Second Annual Seminar, American Institute of the History of Pharmacy, Purdue University, July, 1942.

a way as to supply in an attractive form, many of the values of the usual non-technical courses; and at the same time the material presented, being closely related to that of the technical courses, might serve as a basis for a study that would bind together the whole structure of the student's knowledge and would carry over and be continued in the vitally important years following graduation.

And further it seemed to me that such a course containing both educational bricks and mortar built solidly on the foundation of the profession itself, might appear to be educationally economical or efficient and, as such, might be accepted as a proper subject of instruction both by those who clamor for more technology and by others who are earnestly striving to conserve such of the educational values of the humanities and social sciences as have not already been relinquished.

These are some of the thoughts that have prompted me to explore the potential educational values of the history of my profession. I present my findings to you earnestly seeking your appraisal of them to the end—to the very great end—that the training of your colleagues-to-be may be improved.

The technical values of History of One's Profession are, perhaps, the first to come to mind. In his discussion of a paper on Engineering History given in 1903, Mr. J. L. Harrington wrote:

> "The study of the history of engineering, be it ever so brief and incomplete, will tend to the investigation of the work of other engineers and often, in consequence to the avoidance of errors into which others have fallen and to a great saving of labor in duplicating what has already been well done. Often, too, there will be discovered an excellent foundation for successful work."

In the narrower sense this is merely the oft-repeated advice to search the literature to find out what has been done and is known before starting one's investigation. But in a broader sense it points to the value of browsing through the records of the past in almost random search of ideas with no particular immediate application in mind. This sort of historical stargazing is particularly rewarding when the other brains, through whose orbit one's own may travel, are of men who lived before their time like Josiah Willard Gibbs, or Oliver Heaviside, or to go back still further, Leonard Euler, 1707-1783, whose numerous Latin tomes are whole constellations of ideas.

Of course, as we well know, the great modern development in nearly every department of the kingdom of thought was started in the period called the Renaissance with the rediscovery of relics and manuscripts dating from a vastly more enlightened past. Some, like little Quentin's teacher, may say that the great discovery of that age was of America in 1492, but why did this happen then. Partly, at least, because men were reconsidering the ancient theory that the earth was round and had recaptured a spirit and method of thinking which were all but lost. So we observe Galileo, a bit later, studying works attributed to Archimedes and delighting to show with his weights falling from the leaning tower of Pisa, how wrong was Aristotle and his gullible modern disciples. The deciphering or translation of the ancient manuscripts which had come from Greece sometimes by the most devious cultural and linguistic routes i. e., to say a study of the past, was then a most necessary prerequisite of scientific progress.

But today I think an even greater technical value of these historical studies is to discover the methods of investigation of the fruitful workers of the past. Even though the facts and theories or devices which they discovered or developed may now be either a part of the common stock of knowledge as the laws of motion of Newton or long since superseded as the beam-stress analysis of Galileo, still a study of their methods and of their logic may be highly rewarding.

In his book "The Art of Thought" Graham Wallas constructs his now famous analysis of effective thinking by considering the method used by scientists and by other creative thinkers. He writes:

> "Helmholtz, the great German physicist, speaking in 1891 at a banquet on his seventieth birthday described the way in which his most important thoughts came to him. He said that after a previous investigation of the problem in all directions . . . . happy ideas come unexpectedly without effort, like an inspiration. So far as I am concerned, they have never come to me when my mind was fatigued or when I was at my working table . . . They come particularly readily during the slow ascent of wooded hills on a sunny day! Helmholtz here gives us three stages in the formation of a new thought. The first which I should call Preparation, the stage during which the problem was investigated in all directions; the second is the stage in which he was not consciously thinking about the problem which I shall call Incubation, the third, consisting of the appearance of the happy 'idea' I will call 'Illumination'."

> "And I shall add a fourth stage of Verification' . . . (which) Henri Poincare (another great scientist) in his book, "Science and Method", describes in vivid detail."

So there you have the outline of the "Art of Thought," which is now often referred to and which its own author supports by illustrations from experiences of scientists and engineers.

He could have used many other experiences of the same group of men to illustrate the way in which the "illumination" or the "hunch" appears. Samuel Smiles in his life of James Brindley, England's first great canal builder, shows that he arrived at many of his own ingenious ideas while thinking in bed. James Watt is said to have thought of the separate compartment for the condensing of steam while walking through a cemetery on a Sunday afternoon, and Isaac Newton thought of the great generalization of universal gravitation while reclining under an apple tree. In the case of all of these men the appearance of the "happy idea" was both preceded and followed by a prolonged period of intensive and strenuous thinking.

Yes, I think the history of engineering furnishes some very illuminating psychological information. F. J. Moore writes in his "History of Chemistry":

> "By observing the errors and misunderstandings of the past, we learn to avoid errors in our own thinking by acquaintance with the way in which great men have solved problems, we are assisted in solving problems of our own; by observing the different aspects presented by the same facts in the light of successive theories, we acquire an insight obtainable in no other way into the nature, limitations and proper function of all theories. Finally, as we study how men's knowledge of nature has broadened and deepened with the years, we acquire a better understanding of the trend of thought of our own times, and of the exact bearing of new discoveries upon the old but ever recurring problems of the science . . We judge of the past that we may know the present and judge wisely of the future."

Now may I call your attention to the very high value which is placed by other professions on the history of their respective fields.

The importance which is placed upon history in the training of clergymen does not require demonstration. That fully a half of the studies of the theological school are of fundamental historical nature is the estimate of one of my friends in that profession. I was surprised that he did not place the

estimate higher, for one thinks of church history, history of philosophy, in fact the study of the Bible itself as primarily historical in essence.

For the importance of historical studies in legal training I will quote from a lecture by Henry Wade Rogers of Yale University Law School:

> "The student of law in our times has come to recognize the fact that law is, in a sense, a branch of history, and is to be studied in a historical spirit and by a historic method, and as the student of law recognizes the relation which exists between law and history, so also has the student of history come to realize that a certain relation subsists between history and law".
>
> "The law student who desires to understand his profession, to be a true lawyer rather than a mere pettifogger, must be willing to go back to earlier times to study the origin of and reasons for the legal principles which he wishes to apply. Nor in his study of legal history must he limit himself to the history of his own country".

The professional man must have a sense of the evolutionary and progressive change which comes with time; he must be able to picture the longitudinal cross section of social experience and of scientific development on which time is the abcissa and the present appears as but one of the innumerable ordinates scarcely more significant than the others. And although this curve of progress ascends, it does so irregularly. Or, to change the figure, ever and again history repeats herself, almost,—almost like the return of a pendulum through an arc of centuries as the Renaissance repeated almost, the classic times of yore, and therefore that new scientific errors will be made and new dark ages may possibly recur as the pendulum swings downward again.

The importance of technology or of science in the general history of civilization has only slowly received recognition by the general history writers. Most of them still believe that history is past politics.

At the suggestion of an historian friend of mine, I looked through carefully a large treatise called "History Writers of the Nineteenth Century" by G. P. Gooch, published in 1913, hoping to find some suggestions as to the value of the study of history of science and technology. I did not find any mention of this sort of history at all. Is it any wonder that George Sarton writes:

> "My objection to many histories is that they are too frivolous. Much of the historical writing of the past and not a little of the present, strike me as being a sort of gossip, a sort of exaulted gossip if you please. All of the pageantry centered around kings and solemn dignitaries was picturesque enough, but for one who really tried to understand the development of mankind highly irrelevant."
>
> "The early historian mistook kings for leaders and stewards for creators, he was more concerned with war than with peace and with disease than with health. His accounts were anecdotic and pathological; he paid more attention to the pomp of royal affairs, to the glamour of armies, to the vicissitudes of life in high places, to all the abnormalities and crimes of arbitrary elites than to the quiet and unobtrusive activities of craftsmen, thinkers, and scholars."

Mr. Harry Elmore Barnes writes as follows. He mentions the attempt to view human progress as directly correlated with advances in natural science and says:

> "This remains the least exploited and yet perhaps the most promising of all the social phases of historical interpretation. Its adherents claim a more fundamental causal interpretation in that they contend that the prevailing state of scientific knowledge and application will determine the existing modes of economic life and activities."

Whether this particular theory of historical interpretation is correct or not, it strikes me that a history of technology closely tied in with general history, might be quite as valuable as an historical study for the technical student as a narrowly political history which leaves technology and science out of consideration altogether.

An insight into the place of history in medical education has been made possible to me through a communication from Dr. Arnot B. Luckhardt, of the University of Chicago. He writes:

> "In all three of my elective courses I put in one period a week on the history of physiology or medicine closely related to the subject matter under discussion. These talks are enlivened by slides of the men and their work and their books and reprints."

The above suggests that history can often be taught in and as a part of the technical course itself. In my own course in Hydraulics, I try to do this and I give, nearly every year, just before the Christmas holidays a very amateurishly written drama called "Hydraulics in Hades" in which the various scientific shades talk of their discoveries and of their ideas. My colleague, Prof. C. A. Ellis, believes that the order of discovery of ideas is the best possible one to follow in the class-

room; he finds that historical allusions and references come in naturally as a part, and a very interesting part, of the course itself. And Prof. R. B. Wiley, Head of our School of Civil Engineering, devotes several lectures to the history of the water supply of Rome and then of New York City—in order to show how water supplies have been and should be developed.

Further Dr. Luckhardt writes:

> "We medical men have the (professional) solidarity you speak of because we have cultivated this sort of thing for centuries. We are proud of our record and often know more about the men and the contributions in neighboring fields than the men who teach these specialties. Our knowledge is dependent on so many branches of science. We are, as a result, more catholic in our interests. There are, literally, dozens of histories of medicine in as many languages. In fact we have several dozen in our own language."

And in support of this view of the importance ascribed to the history of medicine, I quote from Seelig:

> "The opinion of medical educators is unanimous, regarding both the practical and cultural value of the study of the history of medicine."

And from Stubbs and Bligh:

> "In order to understand properly a man, an art, or a science, a knowledge of their development and past history is essential; what embryology is to the study of man's structure and evolution, history is to the comprehension of an art or a science."

Thus it would appear that the three long recognized learned professions—theology, medicine, and the law—all devote a great deal of attention to the history of their respective fields. Could it be that this is a reason why these professions still enjoy a superior reputation for that precious seeing of the eye called learning? Perhaps they deserve it. James R. Angell, President Emeritus of Yale University, recently wrote:

> "I am disposed to believe that it is perhaps more common to find this kind of intellectual cosmopolitanism in great lawyers and great physicians than it is in great scientists or even in great men of letters . . . . ."

Medical historians have done something with their subject which is most necessary if history is to be interesting: they have humanized it, and there are several popular medical histories which are best sellers. The essence of what I mean is indicated in the title of one of these, "The Doctor in History."

I want my engineering students to follow the engineer in history. But the story of engineering has yet to be written which will "draw old men from their chimney corners and children from their play." We need more sprightly histories like Wells' "Sociological Cocktails".

I am inclined to think that this "humanizing business" is a most important matter. Wrote George Sarton:

> "The only way of humanizing scientific labor is to inject into it a little of the historical spirit, the spirit of reverence of the past, ... of reverence for every witness of good will throughout the ages. Show the deep human interest of science and the study of it becomes the best vehicle of humanism one could devise; exclude that interest, teach scientific knowledge only for the sake of information and professional instruction, and the study of it however valuable from a purely technical point of view loses all educational value. Without history, scientific knowledge may become culturally dangerous: combined with history, tempered with reverence, it will nourish the highest culture."

And again:

> "The educated people in general must obtain some knowledge and appreciation of science; the scientists must receive some historical training, must be taught to look backward as well as forward, and to look with reverence. These good offices may be rendered to both groups by the teaching of the history of science and of the history of civilization focused upon it,—the noblest part of our history, the one which leaves us neither shame nor regret."

Here is a paragraph taken out of my talk to my engineers which I quote verbatim:

"I think you will be interested in the attitude of pharmacists toward their history. It has for them the special value of recapturing the spirit of a golden past when pharmacy was less of a business and more of a responsible profession. I quote from an article by my colleague, Dr. C. O. Lee: (37)

> "We still speak of pharmacy as a science and an art. The professional aspects of pharmacy are, however, all but submerged, in the eyes of the public, by devious commercial trappings. Nevertheless, people of all walks of life still turn to the pharmacist for expert service as pertains to medicines and related necessities. We are professionally timid and hide all these things under a bushel and in turn, boast of cut prices and increased volume . . . ."
>
> "We need first of all to become thoroughly professionally minded. This will be accomplished, in part at least, by becoming imbued with the idea that the lessons of pharmaceutical history, *and its traditions*, are of value. With a true historical picture of our profession at hand we should be able to go forward with intelligence, interest and enthusiasm!"

This is as far as the comparative study of the other professions has led me in my evaluation of professional history, but I have as yet to consider what I regard as its supreme values, namely, some of the lessons which it teaches—particularly those which bear upon the part which the technologist must play in the political and industrial society of the future.

It has become the almost universal practice of the speech-making presidents of our technical societies who have a philosophical turn of mind to reach into the filing cabinet of history for their illustrations, I suspect for their jokes, and also in part I am glad to say, for the substance of their remarks. It is such wise men reading the lessons of the past who guide the profession in the way it should go.

I am well aware that the so-called scientific historians would frown upon such "vaporous philosophizing" and would remind me that the business of the historian is to describe the past as it really was. Well, I am no historian and I, like the society presidents, claim the privilege of fools who step in where angels fear to tread—to gather the fruits of history which the angels have grown but have neglected to harvest.

In these times when the so-called capitalistic or profit system is so often attacked and defended and when suggestions are made for unionization of technical workers, one frequently hears this question discussed: "What motives impel creative minds to function? Must society hold before them the chance of making a great fortune in order to stir them to produce?" "Is the economic motive the dominant one?" The clear answer of history is, "No, man does not live by bread alone." Both Marxists and Rugged Individualists, please take notice!

Says Sarton from his wealth of knowledge of the history of science:

> "The prime mobile of scientific progress was curiosity, a curiosty which was too deep-rooted to be interested in the ordinary sense, or even to be prudent. This is admirably symbolized by the tale of the tree of knowledge of good and evil which stood in the Garden of Eden. Adam was forbidden to eat of it, but the serpent tempted Eve, and she tempted her husband and they did eat. Their eyes were opened, they lost their innocence and the endless quest of truth was irrevocably begun. Time after time that story has been enacted again. Men have been forbidden to eat of other trees of knowledge, but they have finally eaten of them, nor could they help it. Once that it has been aroused, there was no way of stilling their hunger for knowledge."

> "But aside from that primary cause, there were many others. It would not be too much to say that the progress of science is a function of every human activity, of every human passion, good or evil."

Notice I have not spoken of the motivation of the routine laborers on the one side nor of the business men and financiers by whom the technologists have often been employed on the other. "He that maketh haste to be rich shall not be innocent." The less said about crude selfishness especially in high places and of the resulting and appalling waste of human and natural resources, the pleasanter will be this discourse. But technological history does have a good deal to say on this important subject.

The first lesson, then, of the history of science and of technology is the complexity and potential idealism of the motivation of creative thinkers and the second, I have already referred to. It is the reality of progress, especially the progress of knowledge—the accumulation of facts and the perfection of theory and devices for their utilization. Thus I mean much more than material progress which might result from mere expansion and organization such as occurred in Rome when the bricks of the imperial city were replaced with marble, when the roads and circuses and baths and aqueducts were built by the gangs of slaves of captured peoples, the engineering talent being supplied from Greece, or when the thousands of farmers along the Nile were organized to build what Frontinus regarded as the useless pyramids in gigantic W. P. A. projects. Material progress alone may be accompanied by intellectual and moral decay as in the case of Rome before mentioned. But I contend that the History of Technology demonstrates clearly the reality of genuine progress: material, intellectual, and moral. The first two kinds of progress are clearly evident in every chapter of this story. For evidence of moral progress I cite again the slave labor of Rome and the building code of King Hammurabi of Babylon, of 2250 B. C., wherein it is stated that:

> "If a builder build a house for a man and does not make its construction firm, and the house which he has built collapse and cause the death of the owner of the house, that builder shall pay with his death".

And again:

> "If it cause the death of a son of the house, they shall put to death the son of the builder", etc.

Man's inhumanity to man has decreased,—even in respect to building codes. But, of course, we may have to go a long way back in history to show this improvement.

Progress, the most influential of all modern ideas, one which has been called "both an interpretation of history and a philosophy of action" and which we must depend upon to head off threatening reactionary movements, receives technical, scholarly, and above all, popular support from the record of successful applications of applied science.

And a third lesson to be learned from the History of Technology is that the scientific method and thinking is the "prime mobile" as Sarton would say, of progress. The development of this method of invention is in itself the greatest invention of all times and no bounds can be placed upon its field of application nor upon its potential accomplishments in the future.

And a fourth and sadder lesson is that the previous lesson is very hard to learn and to teach. Some learn to use the scientific method in one department of life, in their own laboratory for example, and yet refuse to use this method of thinking elsewhere,—in economics, politics, or religion, for example. The scientific method does not "carry over" automatically and without effort—even with engineers.

A fifth lesson I have already pointed out: it is the slow evolutionary character of technical progress. The effects often seem to be revolutionary in nature and are often so described but the invention itself has usually been a slow process of building upon tested foundations of past knowledge and practice. I reject the Hegelian dialectic of thesis-anti-thesis and synthesis as not fitting the facts of engineering development at all.

I hasten to add a sixth lesson lest you think I am unduly conservative in my social philosophy. All history, teaches that the great men of the past—the august and imperial names in the kingdom of thought whom conservatives are inclined to follow blindly, were men who did go beyond precedents. They did not slavishly copy the designs of their predecessors nor did they accept old ideas which failed to check with facts that had recently come to light. In technical history "the dead hand of the past" does not hold back the wheels of progress but instead, points a finger forward toward still bolder innovations. As Sir Philip Snowden has written:

"If mankind had continued to be slave of precedent, we should still be living in caves and subsisting on shellfish and wild berries."

Here is another place where we may profitably compare the history of technology and of law. Their teachings complement each other. Technology teaches that progress often results from the ignoring of precedents; the history of law shows that progress fails to occur when precedents are assiduously followed. I have always thought there was some historical significance in the fact that modern law is founded upon the Justinian code, the great compilation of the law of a civilization which ignored science and ushered in the "dark ages."

The history of science and of technology shows that a condition favorable though perhaps not necessary for progress is an intellectual climate of personal freedom (and for the purpose of this discussion the corporation is no person) especially freedom to study, to experiment, to publish, and to associate for this purpose as in the Accademia del Cimento of Florence (1657), of Galileo (in this case the freedom was of short duration) et al, or the Academie des Sciences of Paris (1666) or the Berlin Academy (1700) or the Royal Society of London (1645) with their many foreign correspondents and in the great governmental, educational, and industrial laboratories of the modern world. Such associations lead naturally to a collaboration on a world-wide scale with gifted men of all nations, races, and social classes as in the medieval universities or the World Power Conference or Harvard Tercentenaries of modern times. This is the teaching of scientific and technical history, and tolerance is its natural result.

Finally I submit that the history of technology and of science shows that disinterestedness is a necessary condition for clear thinking, for the application of the scientific method, and so for the continuance of progress. By disinterestedness I mean the habitual attitude of the scientist toward his work, i. e., the elimination in so far as is possible of the motives tending to distort the truth or to choose any but the best plan or to perform any but the best service to society. A mind distorted by prejudice and self-interest cannot be depended upon to arrive at truth. Of all the scientific lessons that modern society needs to learn, this is the most urgent and least understood.

Now, of course, I cannot pretend to have listed all the lessons or values of the study of the history of a profession, for it is nearly as broad as experience itself and fully as deep as life. I have shown how this subject might naturally include important chapters from psychology and logic, from economics, from general history, from aesthetics and from biographical literature, and why it shares in the important values generally attributed to the history of other professions and I have enumerated several of its lessons which I regard as of the greatest importance to modern society. I have only touched upon ethical questions and have discussed sociology not at all. Perhaps, however, I have presented a sufficiently impressive list of such things as the eye of history sees to indicate that this most interesting subject is worthy of consideration as a part of the liberal education of the technical man.

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"Under the pressure of war, speeded education is likely to be incomplete and may result in the appearance of many unqualified practitioners in all the professional fields when the emergency ends."—Dr. Creighton Barker, executive secretary, Connecticut State Medical Society.

The Debt of Chemistry to Pharmacy*

PHILIP J. ELVING
Purdue University

Much has been said in recent years concerning the debt of pharmacy to chemistry. Numerous articles, speeches, and books have pointed out that a considerable part of the advance in pharmacy has been due to synthetic organic chemistry. However, the present time is a very suitable occasion to examine the reciprocal of this attitude, the debt of chemistry to pharmacy. The two-hundredth anniversary of the birth of Karl Wilhelm Scheele is a fitting occasion for us to examine the contributions that have been made by pharmacy and pharmacists to the advance of chemical knowledge. All or most things stand in reciprocal relationships to each other, and the relation between chemistry and pharmacy is no exception to this.

In the fields of pharmaceutical chemistry and biochemistry, pharmacy and chemistry now operate together in the same way that physics and chemistry operate together in certain fields of theoretical chemistry. In these borderline fields which are becoming broader and more comprehensive every year, it is impossible to say where chemistry ends and pharmacy begins, or where pharmacy begins and chemistry ends. However, it is not proposed to discuss the present relationship between pharmacy and chemistry, interesting as that may be, but to confine the discussion to the past, emphasizing the author's feeling that the progress of chemistry during the past four centuries was caused in great measure by the contributions of the practicing pharmacists or apothecaries of the times. The conventional histories of chemistry have tended to overemphasize the contributions made to the development of chemistry by the chemical philosophers of the 16th, 17th, and 18th centuries, many of whom, it is true, also did more or less experimental work in support of their theories. The development of chemistry was, however, due not only to the work of these men, important as that was, but also to the labor of those who gathered the facts of chemistry, the men who discovered new compounds, and who found uses for new and

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old ones. These uses were those that could be applied to the daily life of man, to his food, medicine, and applied arts. These latter contributions were not made by the chemical philosophers or theorists but by the mining engineers, the dyers and the apothecaries. Chemistry is an experimental science and the raw material of chemistry is the preparation of new compounds. In fulfilling this latter function, pharmacy has done a great deal for chemistry, and this paper endeavors to indicate some of these contributions. It attempts to cite some concrete discoveries made by pharmacists, indicating their importance and effect on the development of chemistry, and also tries to indicate the influence of pharmacy as a whole on the development of chemistry.

According to the histories of pharmacy, the independent drug store was in existence in Europe by the twelfth or thirteenth century. In these early apothecary shops medicine and pharmacy were both apparently practiced, although emphasis tended to be laid on pharmacy in the preparation of drugs, herbs, and chemicals. The contact of the apothecary with his raw materials inevitably led to curiosity on his part as to the nature and mode of action of these substances, resulting in some cases in the practice of alchemy and in others in practical chemical manufacturing. If we further realize that the apothecary was well versed in the common technics of chemical operations as then practiced, in distillation, sublimation, fusion, calcination, solution, extraction and filtration, it is not strange that so many compounds were isolated and their properties studied by apothecaries in their pharmaceutical and alchemical studies.

The rise of iatrochemistry in the fifteenth and sixteenth centuries, with its emphasis on the use of chemical preparations as remedies and curatives, was of tremendous importance for the development of chemistry. Iatrochemical ideas themselves can be traced back to the concept that the activities of the body were chemical and that, accordingly, good health depended on the proper chemical composition of the organs and fluids of the body. Illness could, it seemed obvious, be remedied by giving one person some of the substance in which he was deficient. From simple dosage with the needed element, it was a logical step to the use of materials partaking or suggestive of these elements.

From the ancient culture of Arabia and Spain we have record of the reputed existence and work of several men who combined in themselves the functions of physician, pharmacist and chemist. The principal examples of this fusion dedicated to the art of healing are probably Rhases (866-925) and Avicenna (980-1036). We need not concern ourselves with the question of the actual existence of these men; it is sufficient for us that physician-pharmacists in their search for curatives carried on chemical experimentation and in effect began the laboratory study of chemistry. Rhases and Avicenna apparently introduced into chemistry the concept that metals are composed of mercury and sulfur and are formed in the interior of the earth from these materials. The central idea of this concept can be traced back to Aristotle's work on meteorology. Rhases has been called the founder of scientific chemistry since he stressed the results of experimentation and observation in his writings. The introduction of chemical preparations into medicine is credited to him. Avicenna in his great work, *Canon Medicinæ*, devoted the second and fifth volumes to a consideration of medicaments and drugs including the properties, action and characteristics of many chemical compounds. Avicenna is credited with the first description of the manufacture and properties of alcohol and of ether.

In Europe the work of this pair was continued by a famous trio of physician-pharmacist-chemists: Arnold of Villanova (1240-1311), Paracelsus (1493-1541), and the mysterious Basil Valentine (late 16th century). Here, too, we need not concern ourselves with the validity of the existence of Basil Valentine. Even if he did not exist, someone wrote the books ascribed to him and someone did the chemical work described.

Arnold of Villanova, a French physician, is credited with the medicinal use of spirit of wine or alcohol, the distillation of which he describes in his works.

Now we come to Paracelsus; Paracelsus, who with all his swagger, egotism and blatent self-advertisement, did a great deal of good in calling the attention of the upper levels of the social strata to the use of chemistry and chemical preparations in medicine. The dictum accredited to him that the true object of chemistry is not to make gold but to prepare medicines and his call to physicians to experiment in chemistry

were influential in getting under way the iatrochemical movement which culminated in the phlogiston theory and the pneumatic chemistry of the eighteenth century. The stimulus to medical education which began in Paracelsus' time resulted in increased interest in chemistry and in desire to work in that field.

Although Paracelsus' own contributions to chemistry are trifling, he did direct the attention of physicians to the usefulness of chemistry in medicine and pharmacy. He used tinctures, essences, and extracts of plants, hoping, thereby, to extract the active principle from the mass of inert material. To the alchemists' principles of mercury and sulfur, Paracelsus added salt to make up the prime trio, to which he compared body, soul and spirit. While everything was considered to have its own particular kind of salt, sulfur, and mercury, he considered these to comprise only members of the three classes of things named. Mercury was recognized as the spirit of fusibility and volatility, sulfur of inflammability, and salt of fixity and incombustibility.

Paracelsus was also the first to call the strong spirit of wine "alcohol." His greatest importance, however, lies in his followers who under the influence of his ideas and preachings added many new mineral preparations to the available stock of chemical remedies. These disciples included men like Oswald Croll, Gerhard Dorn, and Adrian Mynsicht. The latter was the first to describe tartar emetic.

The works of Basil Valentine, who supposedly wrote around 1470, were probably written a century or more later by their editor, Thölde. The name of Basil Valentine is probably best known for the work, *The Triumphal Chariot of Antimony*, which was in some ways the first comprehensive study of an element and its compounds. The introduction into medicinal use of lead acetate, "sugar of lead," is also ascribed to him. He also discussed the three principles of mercury, sulfur and salt which concept was first developed by Paracelsus.

During the seventeenth and succeeding centuries, the pharmacist or apothecary because of his knowledge of the available chemical technics was the logical person to engage in chemical research. Inasmuch as chemistry promised better and more effective remedies the apothecary had a personal, business and professional interest in utilizing to the utmost

the resources of chemistry. Naturally, therefore, the pharmacists endeavored to learn some chemistry, and in using the chemistry thus acquired to serve their own ends, they increased the sum total of chemical knowledge.

It is significant and important to recall that until comparatively recent years the facilities available for student work in chemical manipulation and technic were non-existent. It was only a little over a century ago that Liebig opened at Giesen the first chemical laboratory devoted to systematic student teaching and even this laboratory was intended only or primarily for men who had completed our equivalent of a two or four years' liberal arts or mining engineer's course. The only readily available place for training in chemistry was the pharmacist's shop. It is, therefore, not surprising that a large number of the famous eighteenth and nineteenth century chemists received their preliminary training in a drug store. The impact of pharmacy on chemistry was made largely through the work of these men, many of whom carried on their pharmaceutical and chemical work simultaneously. Probably the outstanding example of this double career is Scheele who excelled in both. In many instances the research of these men on chemical topics is a direct result and reflection of their pharmaceutical interests. It is perhaps not too rash to suggest that the great development of organic chemistry during the latter two thirds of the nineteenth century was due in greater part than we usually realize to the background of these men.

As evidence of the debt which chemistry owes to pharmacy a number of men are briefly discussed in the following paragraphs, who began their active scientific life in pharmacy and then went on to make notable contributions to chemical science. Many of these men began as apprentices in drug stores and were led into chemistry through their contact with the chemical side of pharmacy. In looking over this list in this regard, it is in order to call the drug store a very good preparatory school for chemistry.

Since the beginning of pharmacy as a profession of its own, there were rigid regulations concerning pharmaceutical education in almost all European countries. These regulations required an apprenticeship of five to seven years, followed by an examination, often followed by another examination if management or ownership of an apothecary shop were to be

assumed. However, because of the close relationship between early scientific chemistry and pharmacy, there were some chemists who became connected with pharmacy in various ways without having gone through the then regular course of pharmaceutical education. Among such individuals were Glauber and Kunkel.

Glauber's (1604-1670) *Pharmacopœia Spagyrica* was intended to teach the correct way of preparing chemical products of pharmaceutical importance. He discovered sodium sulphate which is still known as Glauber's salt, and also was apparently the first to prepare arsenic chloride. On the basis of the many chemical preparations made by him and of his reputation as a chemical manufacturer, he has been called variously the greatest iatrochemist of the period and the first chemical engineer. In one of his works he urged a policy of national self-sufficiency in chemical and other fields.

Kunkel (1630-1703) went from an early interest in pharmacy into alchemy. However, his keen mind steered him from the frauds of alchemy to preparative chemistry. Among other things, he became an expert in the manufacture of glass, improved methods for the preparation of phosphorus from urine, and pointed out the antiseptic action of the mineral acids. At one of the courts with which he was associated, he is said to have supervised the court apothecary shop.

Nicholas Lemery (1645-1715), who was the first man to write a text book of chemistry in the modern sense of the word, was also the most famous of the free lance teachers of chemistry. His knowledge of chemistry was acquired through reading and experimenting in the pharmacy which he operated in Paris. The lectures which he gave in his shop and elsewhere resulted in 1675 in the publication of his *Cours de Chymie* which went through some thirty odd editions. He also published a pharmacopœia, a treatise on simple drugs and one on antimony.

Seignette (1660-1719), an apothecary of Rochelle, France, is known principally for his accidental discovery of the double salt of potassium and sodium tartrates which was long known as Seignette's salt and is now known as Rochelle salt.

Geoffroy the Elder's (1672-1731) principal contribution to the development of chemistry is his tables on chemical affinity. He also did much to hasten the death of alchemy in a

paper presented to the French Academy in which he attacked the deceits practiced by the contemporary alchemists. In his work on materia medica he indicated his understanding of the possibilities of the help that chemistry might give to medicine through pharmacy. It is interesting to note that his father's apothecary shop served as the meeting place for the group of men who eventually formed themselves into the Paris Academy of Sciences. Geoffroy's father and brother, who were also practicing retail pharmacists, contributed much to the advance of chemistry.

Guillaume Francois Rouelle (1703-1770), the teacher of Lavoisier, at one time worked in one of Lemery's apothecaries and later became inspector of apothecary shops, finally being made an associate in chemistry of the Paris Academy of Sciences. Rouelle did much to stimulate the increasing popularity of chemistry by his interesting lectures on the practical implications of chemistry. He was apparently the first to clearly realize that a salt was formed through the action of a base and acid.

Marggraf (1709-1782) was the son of the Berlin court apothecary and began his education in pharmacy and chemistry in his father's apothecary. Through his improvements in methods of analysis, Marggraf became known as the most remarkable analyst of the day. He was one of the first chemists to employ the microscope, using it in his discovery of sugar in the sugar beet. The commercial production of sugar from sugar beet was established by one of his students. He also did much to establish the true nature of many substances which had been heretofore confused.

Baumé (1728-1804), who obtained his training in Geoffroy's pharmacy, did much in the practical application of chemistry, working out methods for the manufacture of ammonia and of ether, and of bleaching silk. He also invented the well known Baumé hydrometer. LaWall gives Baumé much of the credit for dispelling the traditional superstition among physicians and pharmacists with regard to the use of polypharmaceutical combinations of disgusting ingredients.

The next name on the list is that of Karl Wilhelm Scheele (1742-1786), the 200th anniversary of whose birth is being celebrated this year. As was mentioned earlier, Scheele is in many ways the epitome of the fusion of pharmacy and chemistry. He was a practicing pharmacist all his life and his

chemical researches were largely performed after the shop was closed. Born into a poor family, Scheele was apprenticed at the age of fourteen to an apothecary named Bauch. Bauch, like most other apothecaries of the eighteenth century, prepared his own medicines from the crude drugs and chemicals. His apprentice, drawing on his stock of chemicals and chemical library, repeated many of the experiments found in the contemporary works on chemistry. After leaving Bauch, Scheele worked in Stockholm and in 1773 went to Lokk's pharmacy in Upsala. Scheele's unravelling of a chemical problem which had troubled Lokk brought him to the attention of Gahn and Bergman who encouraged him in his chemical researches. Most of Scheele's discoveries were made in the Lokk pharmacy. It is interesting to note that Scheele steadfastly refused offers to teach chemistry in universities, preferring to remain a practicing pharmacist. In 1776 Scheele took over a debt-ridden pharmacy at Köping which in a few years he placed on a sound financial footing.

Scheele is probably the greatest experimenter in the history of chemistry if we take into account the period in which he lived. He justifiably ranks with Berzelius and Emil Fischer as one of the great chemical experimentalists of all time. He did much for the development of qualitative and quantitative analytical methods. He discovered many organic acids including tartaric, lactic, uric, prussic, oxalic, citric, malic, gallic, and pyrogallic. In the inorganic realm he was the first to prepare arsenic, molybdic, tungstic, and hydrofluoric acids. He also discovered chlorine, manganese, barium and oxygen. Although Priestley is generally credited with the discovery of oxygen, to Scheele must be given the credit of having discovered it first, of having prepared it in three or four different ways, and of having prepared it as the result of a series of carefully planned experiments. This is in contrast to Priestley's discovery which was largely the result of accident. The reading of Priestley's and Scheele's own accounts of the discovery of oxygen will leave little doubt as to whom the credit for the discovery of oxygen should really go. In addition Scheele recognized oxygen as that part of the air which supports combustion. He discovered many other substances, and was apparently the first chemist clearly to understand that metals may exist in several states of oxidation. All these discoveries were made under the most appalling experimental

conditions. He had only the most meager and primitive chemical equipment. He did not have the benefit and stimulus of the academic environment. In addition, he had to contend with poverty and with the fact that because of his lack of position his papers went either unpublished or were tardily published. It was only after his death that it was fully realized what an enormous amount of work he had accomplished in forty-three years. When he was inducted into the Stockholm Academy in 1775, he was called the studious or zealous pharmacist. Surely few other men in the history of science have made so many important contributions to human knowledge as did this humble apothecary in his spare time.

Klaproth (1743-1817), who was associated for part of his life with the Rose family pharmacy, was probably the most accomplished analytical chemist of the latter part of the eighteenth century. His precise analytical technic enabled him to discover three of the chemical elements. In addition to his many contributions to chemistry, he bettered and extended pharmaceutical practice by improving various formulas and by assisting in the compilation of the *Pharmacopœia Borussica*. He laid the basis for the modern methods of mineral analysis.

Proust (1754-1826), originally an apothecary at a Paris hospital, was still another teacher of pharmacy who did outstanding work in analytical and synthetic chemistry. The result of his precise experimentation resulted in the enunciation of the law of definite proportions, one of the fundamental laws of chemistry.

Bertrand Pelletier (1761-1797) was trained in pharmacy in his father's apothecary shop at Bayonne and managed a pharmacy at Rouen before devoting himself to teaching. He investigated the arsenates, phosphates and phosphides of many metals and devised new methods for making soap. His son, Joseph (1788-1842), who owned and operated a pharmacy in Paris, was a co-discoverer of many alkaloids including quinine, strychnine, brucine and cinchonine.

Vauquelin (1763-1829), who after his pharmaceutical apprenticeship at Rouen was associated with the teaching of pharmacy during his whole life, was another outstanding analytical chemist as evidenced by his discovery of chromium

and beryllium. He was also active in organic chemistry in which field he discovered many compounds.

Stromeyer (1776-1835), originally educated as a physician, was connected with pharmacy through his position as a professor of chemistry and pharmacy as well as being inspector-general of apothecaries in the kingdom of Hanover. He discovered cadmium by an interesting accident, possible only because of his connection with pharmacy. On an inspection trip in 1817 he noticed that a certain preparation which according to the Hanoverian Pharmacopœia ought to have contained zinc oxide apparently contained zinc carbonate. The result of this discovery is best described in Stromeyer's own words:

> "As I was last harvest inspecting the apothecaries' shops in the principality of Hildesheim, in consequence of the general inspection of the apothecaries of the kingdom having been entrusted to me by our most gracious Regency, I observed in several of them, instead of the proper oxide of zinc, carbonate of zinc, which had been almost entirely procured from the chemical manufactory at Salzgitter. This carbonate of zinc had a dazzling white color, but when heated to redness, it assumed a yellow color, inclining to orange, though no sensible portion of iron or lead could be detected in it."

To ascertain why this substitution had been made Stromeyer visited the pharmaceutical firm which had supplied the material:

> "When I afterwards visited Salzgitter, during the course of this journey and went to the chemical manufactory from which the carbonate of zinc had been procured; and when I expressed my surprise that carbonate of zinc should be sold instead of oxide of zinc, Mr. Jost, who has the charge of the pharmaceutical department of the manufactory, informed me that the reason was, that their carbonate of zinc, when exposed to a red heat, always assumed a yellow colour, and was on that account supposed to contain iron, though the greatest care had been taken beforehand to free the zinc from iron, and though it was impossible to detect any iron in the oxide of zinc itself."

Stromeyer was greatly interested in the discoloration accompanying the conversion of the zinc carbonate to oxide:

> "This information induced me to examine the oxide of zinc more carefully, and I found, to my great surprise, that the colour which it assumed was owing to the presence of a peculiar metallic oxide, the existence of which had not hitherto been suspected. I succeeded by a peculiar process in freeing it from oxide of zinc, and in reducing it to the metallic state."

It is interesting to note that in the same year, 1817, K. S. Herrmann, for many years a retail pharmacist and later a manufacturing pharmacist, also discovered cadmium. The question of priority in discovery between these two is still open.

Oersted (1777-1851), who recevied his early scientific training in his father's apothecary, went on to win renown as pharmacist, physician, and chemist. His principal discoveries are the magnetic action of the electric current and the isolation of aluminum. It would be interesting for someone to investigate the number of famous scientists who began their scientific careers by assisting in the parental pharmacy. Besides Oersted the list would include Marggrat, Geoffroy, Rose, Pelletier, Mohr and many others. The father of Liebig dealt in technical raw materials and dyestuffs.

Sir Humphrey Davy (1778-1829) might be cited as an example of a person who might never have made his contributions to chemistry if he had not been apprenticed at an early age to a surgeon who dispensed his own drugs, leaving their preparation to his apprentice. It is interesting to note that his first scientific work was the investigation of the physiological properties of nitrous oxide. His accomplishments in physics and chemistry are so well known that it is only necessary to mention that he founded the science of electro-chemistry and isolated or identified single handedly the alkali metals, the alkaline earth metals, and the halogens.

Döbereiner (1780-1849), who was a pharmacist, self educated in chemistry, became professor of pharmacy and chemistry at Jena. It is significant to note how many of the great chemists of the nineteenth century were given the status of professor of pharmacy and chemistry. Döbereiner interested himself in all phases of chemistry and is best known for his pioneer attempts at the periodic classification of the elements and for working out the relationship between ethyl alcohol and acetic acid, in the course of which work he discovered the process of catalysis.

Heinrich Rose (1795-1864) came from a famous family of pharmacists and chemists which included his brother, Gustav Rose; his father, Valentin Rose the Younger; and his grandfather, Valentin Rose, Senior. After an apprenticeship in a

pharmacy in Danzig, he worked for some time as a pharmaceutical clerk in Mitau. Throughout his subsequent professional career he was professor of chemistry and pharmacy at Berlin. Rose was the outstanding analytical chemist of the early half of the nineteenth century, his outstanding contribution being the introduction of hydrogen sulfide into qualitative analysis.

Dumas (1800-1884) was another great chemist who began his career as a pharmacist. Fortunately though, unlike Scheele, he attracted the attention of a famous individual who helped him to success. In the case of Dumas, Von Humboldt enabled him to secure a professorship in chemistry at Paris. Dumas' many contributions in organic and analytical chemistry are well known, his methods for nitrogen and for vapor density determinations being still in use. His theoretical work led to the theory of substitution in organic compounds. He also distinguished himself with his studies of alkaloids, volatile oils, and dyes.

Liebig (1803-1873) was apprenticed at an early age to a village druggist. He left pharmacy after about ten months of apprenticeship. The fact that he occupied a small room connected with the apothecary shop enabled him to spend a considerable part of his nights in chemical experimentation which was much to his liking. At this time he became interested in silver fulminate which was soon to lead him to the discovery of isomerism in organic compounds. While working one night in the drug store with silver fulminate, an explosion occurred which resulted in his being discharged from the pharmacy and in his entering a university to study chemistry. It can be said that Liebig was blown from pharmacy into chemistry. His work in chemistry and in the related fields of agricultural and physiological chemistry have earned him a place among the great chemists of all time. It is quite probable that his interest in physiologically active chemicals and plant products was due to his early association with pharmacy.

Balard (1802-1876) was a pharmacist in Montpellier, France, who on the basis of his self-taught chemistry was able to discover bromine, which led to his being given a professorship in chemistry at the Sorbonne where he had a distinguished career. It is interesting to note that all three halogens were discovered by pharmacists, chlorine by Scheele, bromine by Balard, and iodine by Bernard Courtois (1777-1838).

Courtois was a practicing pharmacist at Dijon before going to Paris where he devoted himself to research and manufacturing, in the course of which work he discovered iodine in the ashes of seaweeds.

Carl Friedrich Mohr (1806-1879) was another who was trained in the paternal apothecary, which he operated for many years before becoming, late in life, professor of chemistry and pharmacy at the University of Bonn. He did much to introduce titrimetric or volumetric methods into chemistry, in connection with which he developed many pieces of apparatus which bear his name. His books on titrimetric analysis were of the greatest service in developing rapid methods of control analysis for the chemical industry which had begun to spring up by the middle of the past century.

An important aspect of the debt of chemistry to pharmacy which must not be overlooked is seen in the chemical journals which originally began as journals devoted to pharmacy and gradually changed over to chemistry. Liebig's *Annalen* provides an interesting case history. Founded in 1832 as *Annalen der Pharmacie* as a result of the combination of two existing pharmaceutical journals, its name was changed at Woehler's suggestion in 1841 to *Annalen der Chemie und Pharmacie.* Finally after Liebig's death, the name was changed in 1874 to *Annalen der Chemie.*

An important factor contributing to the popularization and improvement of chemical compounds or mixtures is their inclusion in pharmacopœias. This usually results in improved methods for their manufacture, in more extensive study of their properties, and in better methods for their analysis or testing. Probably, one of the best ways of focussing attention on a chemical or group of chemicals and of stimulating research on those compounds is to find a use for them in pharmacology. Recent examples of this are the sulfa compounds, the vinyl compounds, and the organo-mercury skin disinfectants.

To illustrate an important instance or corollary of the statement just made, one might cite the history of the adulteration of foods and drugs. The efforts to detect and to ascertain the extent of the contamination of foods and drugs gave tremendous impetus to the development of analytical chemistry during the nineteenth century. For example, the field of

chemical microscopy arose out of the efforts of Hassall, Mitchell, Normandy, and others to detect adulteration and sophistication in food and medicine, and out of the labors of Wormley and others in detecting poisons. The latter field leads one to a consideration of the alkaloids. This important subdivision of the field of organic chemistry was first brought to the attention of the chemists by the pharmacists who engaged in the isolation, study, and use of alkaloids for literally centuries before chemists were finally made aware of these compounds. It was an apothecary, Sertürner, who first definitely established the nature of these plant principles and indicated the possibility that the medicinal action of many plants might be due to such principles.

The author wishes to thank Dr. George Urdang, Director of the American Institute of the History of Pharmacy at the University of Wisconsin, for giving so generously of his time and knowledge in carefully reading the manuscript of this paper and making many suggestions which were of the greatest help to the author.

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The American Institute of the History of Pharmacy and the Pharmaceutical Press*

ROBERT L. SWAIN
Editor Drug Topics, New York City

First of all let me express my gratification that there has finally been established The American Institute of the History of Pharmacy. The Institute most certainly corrects a glaring defect in our organizational setup, and furnishes the basis for the hope that in due course it will take a more active part in pharmaceutical affairs.

I look to the time, which should not be too long deferred, when the Institute may be adequately financed, so that it may be in position to bring to bear upon pharmacy and its problems the perspective of scientific, historical research.

While it is well for the Institute to surround itself with the outward manifestations of historic interest such as books, old documents, ancient pharmaceutical apparatus, remnants of old drug stores, periodicals and writings of earlier days, pictures of great men and great events, and wrap itself in the garb of the scholarly historian, its chief value to pharmacy will lie in its active and not static frame of mind.

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*Read at the 1942 meeting of the Institute at Denver, August 19.

It is to be earnestly hoped that the Institute will not be content to become an animated museum, expending itself simply as an agency of accumulation. By this I mean that it needs to undertake specific projects so that pharmacy of today may have the benefit of what others have labored for and dreamed about.

In the bound volumes of the Proceedings of the American Pharmaceutical Association there are great thoughts expressed, great programs undertaken, only in due course to fade out among the debris and frustration of the times. What happened to make shipwreck of these brilliant and promising aspirations? The answer might be important even now.

Of all the great movements in behalf of professional pharmacy, pharmaceutical education is about the only one to keep to its course, weather the storm, and finally reach safe harbor. While it is to be anticipated that pharmaceutical education will continue venturesome and seek still further progressive achievement, its history gives assurance that it will move ahead and never turn back.

Pharmaceutical legislation, as the old records clearly testify, was conceived in a truly professional spirit, and sought truly professional objectives.

Here the progress has been spasmodic, confused, delayed and thwarted. A historical contrast of the forces underlying pharmaceutical education and pharmaceutical legislation might be of considerable interest.

It seems to me that Cicero had a keen appreciation of the true value or role of history when he said: "Not to know what has been transacted in former times is to continue always a child. If no use is made of the labors of past ages, the world must remain always in the infancy of knowledge."

History becomes important when it brings to successive periods the fundamental truths, the deathless principles, the precepts and teachings of experience, which have given rise to the political, social, economic and cultural forces which must underlie a permanent and civilized civilization. The present is but the constantly receding frontier of the past. When it is complained that judicial precedent permits us to be governed by people in their graves, emphasis is being laid upon the inevitable and inescapable fact that what we do or think today will either dog the steps or clear the way of others yet to come.

History is indeed all bunk unless it develops powers of analysis and adaptation, as it is only by understanding the significance of the past that its relationship to the present can be rationalized. What value is it, merely as a speck against the background of time, that a document known as Magna Carta was once signed by an English king? The legislative devices which brought about the gradual decline and later full collapse of the feudal system of land tenure are mere historical curiosities, unless their underlying causes and objectives are understood.

What, standing alone and uninterpreted, is the significance of the clash between the common law courts and the courts of equity back in the foundational days of British jurisprudence?

The United States Pharmacopœia was established in 1820 by medical men, even though there had been many previous attempts to bring about compilation and uniformity of pharmaceutical formulæ. What is the historic significance of the forces which made the United States Pharmacopœia necessary, and do they exist with undiminished vigor today?

The National Formulary was instituted by the American Pharmaceutical Association in 1886, sixty odd years after the Pharmacopœia. Why was it thought essential to have both the U. S. P. and N. F.? There was no rivalry then. Why should there be rivalry now? A historic appreciation of the facts and conditions which made both essential to public health, would do much to calm the controversy which has sprung up with respect to the so-called rights and privileges of each other.

Just as I am convinced that the world is going through its most prophetic experience since the dawn of creation, I am just as fully convinced that there are forces of fundamental significance working within the field of pharmacy. I think I can discern trends both in thought and action, which are certain to play a dominant part in the reshaping of pharmacy which is slowly, but inevitably coming about.

To one who listens with attentive discernment, and who has the power to distinguish deep-seated undertones from superficial noises, there appears to be subdued rumblings of dissatisfaction and discontent. Contemporary leadership has not altogether met the test, and the current level of pharmaceu-

tical thought and action is being looked at by questioning, skeptical eyes.

In these changing, realistic times, nothing would be more helpful than having present trends in pharmacy charted, interpreted, and rationalized in terms of sound historical teachings. We need to understand them in the light of comparable movements of the past, so that their current significance may be determined with true historic introspection.

The cleavage in professional pharmaceutical opinion, the controversy which rages over matters of economic and commercial importance, the urge to resolve pharmacy into its basic essentials, the desire to evaluate pharmacy in terms of its social significance, the dissatisfaction over governmental attitudes, the apprehension lest pharmacy is fighting a losing battle in the esteem of the public, the interest shown in closer relationships to medicine, the attempts toward economic stability, all indicate that principles and procedures of fundamental character are in process of becoming forged and patterned for the pharmacy of tomorrow.

Simply in the way of illustration, would anyone contend that pharmacy in this country has fully benefited from all that has been proposed and done by the American Pharmaceutical Association during its ninety odd years of eventful history? Has not much of the loss and lag been due to the fact that no one has taken the time, or displayed the ability to translate association activities and objectives in terms applicable to the daily routine of pharmacists?

I am fully convinced, and have been for some time, that pharmacy lacks authoritative, historic interpretation, and that it rushes pell mell from one absurdity to another because there are no basically thought out objectives and little or no correlation of effort and initiative. Now, in making this observation, I am not concerned with surface or passing movements, but rather with those things which are fundamental and real when viewed in the light of their true historic understanding.

Up to this point, I have made no direct reference to the relationship of the pharmaceutical press to the work of the Institute, largely because the place of the press in any scheme of historical appreciation is quite obvious. Through the press, interest in the work can be stimulated and maintained, and

much cooperation afforded in behalf of the collection of pharmaceutical objects of historic interest.

But, the pharmaceutical press can be of value in a much more fundamental manner. The press mirrors pharmaceutical events, and portrays in endless continuity the things pharmacists are doing and thinking about. It charts the currents and cross-currents of pharmaceutical opinions, and affords a close-up of contemporary philosophies.

The press notes the rise and fall in economic pressures, and records the facts upon which may be predicated economic dissertation and experimentation. In other words, contemporary pharmacy will be found accurately reflected in the pharmaceutical press, with its high and low points, and with its glories and defects splashed against the moving panorama.

The pharmaceutical press, in its entirety, is the source material which will become of inestimable value to the institute, once it is placed in position to analyze, interpret, evaluate and influence the currents and trends in pharmacy from the vantage point of true historic insight.

Speaking for DRUG TOPICS, I am happy to pledge the fullest support and cooperation.

The American Institute of the History of Pharmacy and the Pharmaceutical Press*

RUFUS A. LYMAN
University of Nebraska

Someone has said, "To know nothing of the past is to remain a child always." A knowledge of past events is necessary to lay plans for intelligent guidance in the future. In the terrible and cruel struggle that is now world wide, there would be no hope if it were not for the knowledge of what has occurred in ages gone by. Through blood and sweat and tears and with endless pain, generation after generation of men have struggled for better things. Out of each holocaust has come a finer civilization. It seems that every generation experiences the same bitter struggle. Every generation must

* Read before the Institute at the 1942, Denver meeting.

pass through the same experience. It is the way of the world. It is the biological way.

Man begins as a single cell. Then there is a fusion of two cells. Then a new animal is on the way. As it develops it passes through all the stages that animals have passed through during the centuries that man has been struggling upward to become the first fruit of the biological process. All men since have followed the ancestral pattern. And that reminds me of a story. The old bishop lay on his bed, dying. Four score and more fruitful years lay behind him. In the death struggle he was bemoaning the fact that he was passing with so many things he had planned to do still undone. The young bishop sat beside him and as he caressed the fevered brow he attempted to console him thus: "Never mind, dear bishop, you have done a good work, you have accomplished many things; many things you have begun are still undone, but here am I in the vigor of young manhood, where you lay the unfinished task down, I will take it up and carry on." Slowly the old bishop opened his eyes, for the shock was deep, and surveying the young bishop with an expression of tenderness mixed with pity he said, "No, young man, where I began, there you begin also."

One of the high constructive and administrative engineers of the Burlington system is a graduate of the college of engineering of the University of Nebraska. After graduation when he applied to the railroad for a job at which he might use his talents and his training, he was set to the task of piling railroad ties at the Havelock shops. He was transferred from one job to another until he had run the gamut of all the menial tasks there were to do before he was permitted to begin the upward climb to the position of chief engineer of the Burlington lines, west. But it is inconceivable that the young bishop on the one hand and the young engineer on the other, could not advance more rapidly and reach greater heights of accomplishments if they had a knowledge of the mistakes and the successes of their predecessors. The story of the bishop and the story of the engineer are illustrative of what the historical study of pharmaceutical failures and pharmaceutical accomplishments should do for the future progress of pharmacy.

Fifty years ago medicine was emerging from the apprenticeship system. Even in the writer's college days it was the rule for every prospective medical student to have a preceptor.

When the student registered in the medical school he was required to give the name and address of the doctor under whom he had served as an apprentice and the time of such service. Although in those days fully two-thirds of the class were not qualified by present day standards to undertake medical study, there was not a man in the class who did not at once assume all the dignity of the medical man of his day.

I am sure no one in the class knew much about the history of medicine. But we had learned from the old preceptor that there were heroes in medicine (he was one himself). We learned there were great problems in medicine worthy of our time and effort and money. We had been taught the dignity of the relief of human suffering and the saving of life. Every member of the faculty who came within speaking range of the freshman, drove home the lessons the old preceptor taught. No wonder the medical student developed a morale to a degree that other students mistook it for egotism. Since premedic courses have been established the same philosophy of the dignity of medicine has been carried back into those years. I have yet to hear a single medical man, general practitioner or specialist, belittle the work of the medical profession. Is it any wonder that medical schools have for years been running to capacity, with thousands of prospective medical students being turned away from their doors?

Pharmacy was slower than medicine in discarding the apprenticeship system as the basic method of professional training. The present generation of druggists is approximately half apprenticeship and half college trained. But it would seem that those who were apprenticeship trained did not get from their employers an inspiration comparable to that which the medical student received from his preceptor. It is also evident that the present generation of college trained druggists did not get the type of inspiration from their instructors that the present generation of medical men did from theirs. Even today there are too many men teaching pharmacy on our college faculties who want to be known as chemists rather than pharmacists and I personally know of instances where such men have expressed that desire before pharmacy students in the classroom. The reaction the student has is that he, the student, is in the wrong pew in studying pharmacy. The chemists, who have always been good propagandists, have not been slow in supporting the idea. They have gone so far as

to claim as a chemist every pharmacist who made a discovery, whether it was the discovery of an element or a friction match. More than half a century ago, when the present pharmacy building on the campus of the University of Nebraska was being built as a chemical laboratory, a medallion bearing the face of Scheele was set in the wall beside the front entrance. Thirty-one years later the words "Chemical Laboratory" were erased from the stone forming the arch above the entrance and in its place the stonecutter's chisel sank the words "College of Pharmacy". In other words, on the Nebraska campus, it took thirty-one years for the pharmacist Scheele to come into his own. As a matter of history at Nebraska, Scheele did not come to the College of Pharmacy. The College of Pharmacy came to Scheele.

Two of the most delightful days of my life were spent last month end on the campus of Purdue University. The occasion was the annual Seminar of the American Institute of the History of Pharmacy. In those days only one shadow crossed my path. As I passed in front of the chemistry building, I observed on the cornice, cut in enduring stone the names of the chemically renowned of the ages. Among them was the name "Scheele". It was placed next to that of the great Remsen, whose textbook was the property of every beginning student in chemistry of my generation. The only comfort that I got out of the scene was that Scheele's name was so placed that in macy building. And yet there was a touch of sadness in it, as if he was longing to span the space and finally rest where he belongs. Let us hope that some day Purdue University will satisfy that longing.

And here I am reminded of another story, one which Boake Carter tells. Carter was born in Russia. He was accused of being a communist. He says it was done on the same basis that if a mother cat gave birth to some kittens in an oven that made the kittens a batch of biscuits. Scheele was an apothecary. He refused to leave his apothecary shop for another position and he had many offers. I suppose the chemists claim him because he discovered an element. By the same criterion, if a doctor should discover a dollar, he is no longer a doctor: he is now a banker and his name should be emblazoned in Washington on the balcony of the United States Chamber of Commerce.

I have called attention to the fact that the medical colleges are running loaded to their student capacity. I have said this is due to the attitude of the medical men toward their work. I have never heard a student criticized because he entered the medical field. Medical men have also imbued the public with the dignity of medical practice and the accomplishments of medical men.

On the other hand, I personally have known of hundreds of students of pharmacy being asked by practicing pharmacists the question, "Why in hell are you studying pharmacy?" With that kind of an attitude of the practicing pharmacist toward his profession it is amazing that there are any students in our college of pharmacy at all. If the present retail druggist wants to overcome the shortage of help about which he now complains so bitterly, he had better look well to his language and stop damming the student supply at the source. The public is critical of the pharmacist and why should it not be? Yet the public at its worst has a higher regard for pharmacy and what pharmacy should be and do, than the average druggist himself. If it did not have, there would be no pharmacy students today and no support for pharmaceutical education in our universities.

Anyone who has pioneered in pharmaceutical education in the last forty years knows the obstacles that were met and had to be overcome in order to obtain support for pharmaceutical education on the campuses of our great state universities. In my own state that support did not come from the rank and file of the practicing pharmacists of the state. Some were violently opposed, the majority were indifferent. Support did come from a few farseeing laymen who recognized the importance of the pharmacist and the drug store in the public health service. It also came from a handful of practicing druggists who were readers of pharmaceutical history and who had learned the part the pharmacist has played in the past in science, in industry, in research, in education, in literature, and in the art of living and who had a vision of greater things for the future. I believe the most important service that can be rendered our profession today is to have a generation of pharmacists that are historically minded and filled with the visions and the dreams that the knowledge of the accomplishments of pharmacists inspire. Much has been said in recent years about the responsibility of the colleges of pharmacy for

the instillation of lofty motives and high ideals in the minds of college students. But how effective will such teachings be when the student meets the practicing druggist who does not respect his own vocation? The teaching in college is not enough. We must have active cooperation with the retail drug trade. If the retail drug trade does not know that, then they must be informed. The great body pharmaceutic can not be brought back to school. As I see it, the only agency that can carry this message to the retail druggists is the pharmaceutical press. At last I come to my subject.

As an example of what the pharmaceutical press can do, I wish, as I have on previous occasions, to call attention to and commend the character of the editorial section of Drug Topics. Dr. Robert L. Swain publishes a magazine that all druggists read if they read anything. His attitude toward the possibilities and the responsibilities of the pharmacists is most wholesome and inspiring. I am certain that this column is one of the most wholesome influences upon the conduct of pharmacy in our day. If the whole pharmaceutical press could do a job equally as good I am certain the trend in pharmaceutical practice would noticeably improve.

In like manner the pharmaceutical press is the only avenue by means of which the historical accomplishments of pharmacy can be carried to the men in the field. To do this the pharmaceutical press needs help itself. Editors are not historians any more than pharmaceutical teachers are. The pharmaceutical press needs a reliable source of historical material. It needs more than a source. It needs expert advice as to the material to be presented and the manner of presentation. It needs a responsible organization upon which it can rely for the recording, the interpretation, and the evaluation of current pharmaceutical events so as to make it useful in planning our projects and directing our conduct in the days that lie ahead.

For two years I have followed the work of the American Institute of the History of Pharmacy. To me personally as an editor, the Director of the Institute has been helpful and inspiring. No paper of a historical nature published in the American Journal of Pharmaceutical Education goes to press without the Director's comments. He has become indispensable to author and editor alike. The Scheele exhibit which he has prepared is an example of the service being rendered. My

own institution has purchased an exhibit, not only for instructional purposes in the classroom in the course in the history of pharmacy, but as a means of instruction of the public at our annual open house. It is to be exhibited in drug stores down town wherever we can place it so that he who runs may read and if he does not read, at least he can see. It will be a constant reminder of the accomplishments and the service of pharmacy and pharmacists.

Finally, since I have painted a picture, and a true one for which I make no apology, and since I have said some things that are harder for me to say than for you to hear, let me paint a final picture which is also true and which to me at least is inspiring because it is pregnant with possibilities of service.

There is abundant evidence that the pharmacists of America are becoming historically minded. Proof of this fact is seen in the establishment of an historical section in the American Pharmaceutical Association. This section has become one of the most enthusiastically supported groups in the Association. Many state pharmaceutical associations have appointed historical committees and historians to record the history of pharmaceutical accomplishments and progress in their respective areas. The American Association of Colleges of Pharmacy has appointed a historian for the express purpose of writing the record of pharmaceutical education in this country. The National Pharmaceutical Syllabus Committee has made the study of the pharmaceutical history a requirement in the pharmaceutical curriculum. The national and official pharmaceutical accrediting agency, the American Council on Pharmaceutical Education has approved the curricular program. The Director of the American Institute of the History of Pharmacy has been requested by the librarian of the Library of Congress to make a survey and evaluate the pharmaceutical collections in the library and to recommend an acquisition policy and methods that will improve the accessability of the material in the pharmaceutical field.

During its brief existence the American Institute of the History of Pharmacy has won the support of the outstanding pharmaceutical educators of the country. It has won the support of the retail druggists of the state of Wisconsin to a degree that they have given it a financial support which made possible its establishment and maintenance to date. It has

become affiliated with the American Pharmaceutical Association. The National Association of Retail Druggists is sympathetic with its endeavors and appreciates its possibilities.

What more need one say to show we are on the way to a greater and ever widening and increasing field of usefulness.

Honorary Societies*

RUDOLPH A. KUEVER
College of Pharmacy, State University of Iowa

Education is as old as man himself. Even as an organized profession, the process of directed training reaches back into ancient days. Education is a highly selective profession: the fruits of learnedness never are grasped by the masses of the people, but only by the relatively few whose abilities and inner determinations permit them to blend knowledge with understanding and to utilize the product.

To those few, education always extends a dual challenge: the challenge of contributing to the welfare and progress of the human race, and the challenge of personal success. History records that periodically the second challenge has taken precedence over the first, and the resultant tyrannies, periods when the successful few sought to rule the miserable many, have clouded the beacon lights of a great civilization from the days before Rome to the present day and hour.

Great advancements in mass education, to offset the threats of those who would use wisdom selfishly to enslave the ignorant, have occurred only in recent decades, and the greatest advancements of all have been made in our western civilization. In modern-day America, a larger percentage of our native young people have the advantage of attending institutions of higher learning than in any other nation in the world. There are two basic reasons for that: (1) the national educational standard is high, and greater numbers have the necessary educational backgrounds for advanced training; (2) the national living standard is high, and greater numbers have the necessary money to attend colleges and universities.

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* Read before the Rho Chi Society, 1942 Meeting at Denver.

In a system such as ours, in which the fruits of education are available to all, it is natural that we should have large groups of students whose intelligence indices are average or below, as well as large groups of highly intelligent students. That is, of course, fundamental. But it is unfortunate that in both of these groups—the highly intelligent as well as the average—there are those who are not willing to expend the effort necessary to turn natural ability into real success. It is unfortunate that many who possess God-given talent, for which they should be most thankful, still lack the spark to drive them to the full use of those powers. We have all known many intelligent, able students who failed to realize fully that effort is essential to success, no matter how great one's natural ability. Conversely, we have known students whose natural intelligence indices were not too high, but whose ambitions and energies were powerful—sufficiently powerful to take them far higher than their intellectual powers alone would have done.

Since dawn of organized human activity, mankind has been on the lookout for leadership, and for leaders; the stars have shone brightest, down through the ages, for the men and women who did more than their share of the work—the ones who set the pace and stood head and shoulders above their fellows, not only because they possessed the talents but because their talents were doubled and trebled by ambition and inexhaustible effort.

We look for leaders, too, in education—in pharmaceutical education. And constantly, the best qualified students sift themselves from those of lesser qualifications. For the most part that is a relatively undirected process which follows a trend of natural selection; some students progress to higher levels and others fall by the wayside. And you may be certain that the ones who fall first are those whose natural abilities suffer for a lack of effort to go with them.

The need for some kind of process by which students with top qualifications—including such intangible ones as conscientiousness and a love of work—are distinguishable from lesser qualified students, is evident even in secondary education. Many students who are not capable of working at university levels waste time and money trying it. But it is necessary that we use such a sifting process at the undergraduate level

in colleges and universities. Many students who have difficulty with college undergraduate work, and even some who do not, lack the native intelligence necessary for post-graduate work in a highly specialized field. Moreover, many students who have plenty of intelligence lack the ambition to pursue post-graduate study, lack the internal spark which makes them expend the effort necessary to take them to the peak of the professional heap.

It is unnecessary to develop the thesis that too many colleges unfortunately are more interested in their enrollment than in the qualifications of their students. It is also unnecessary to observe that in a professional field, such as pharmacy, there is room only for the highly qualified student, even at the undergraduate level, and that correspondingly there must be great care in the selection of graduates who are qualified for work at the highly important post-graduate level, where effort counts for as much as sheer ability.

How are we to separate the best qualified students from those who, though competent and able, may lack determination, the interest, the deep-seated sense of personal responsibility which marks the most desirable kind of professional man? One such sifting method deserves consideration: students who, near the end of their undergraduate career, are recognized by honorary societies deserve the special attention of educators who are interested in a student's qualification for post-graduate study and research.

Honorary societies, like education itself, are modern products of the ancient past. In America, they date back to the earliest beginnings of education in the English colonies. While honorary societies are, of course, subject to the integrity and ability of their memberships, it is significant that in all fields, the distinction of membership in honorary groups has been reserved for those who possess more than talent and knowledge of how to use it. Professional societies in particular have emphasized the importance of personal integrity, dependability, enthusiasm, all-round promise as requisites for the selection of their members. So it is that only those students, at the undergraduate level, who have ability plus those other intangible yet highly important attributes of the successful professional man, achieve the distinction of belonging to such highly selected groups. Ability often times is a gift of divine origin; but real effort is a matter of strict and painful personal

concern. Only a combination of the two can produce a maximum effectiveness. It is such a combination which the honorary society seeks to promote as a goal of achievement toward which all students should strive.

High scholarship and all-round student achievement carry with them certain rewards and certain responsibilities, duly recognized by the serious student. Honor, distinction, the promise of some degree of success in the future are intermediate rewards in and of themselves. The superior student accepts the accompanying responsibilities of hard work and personal sacrifice as stepping stones to his goal. In the field of pharmacy, these top students are the ones upon whom the world depends for ever better medicines and pharmaceutical procedure; moreover, the profession depends upon them for the pace of pharmaceutical development and progress. They are the pace-setters, in the fore in professional thought, planning and action.

Such honorary organizations as Rho Chi serve the pharmaceutical field as a partial sieve for the selection of really outstanding students in the field. But there should be greater interest in the general honorary societies of the scientific field, too—honorary societies like Sigma Xi—membership in which signifies leadership in a much broader sense, unrestricted to a single scientific field of research and practice. It is worthy to note that this year, the Iowa Chapter of Sigma Xi, at the State University of Iowa voted to amend its By-Laws to include the College of Pharmacy in the official list of departments with its own departmental representative on the nominating committee. This is a distinct step toward the integrating of the leadership of outstanding pharmaceutical students with the leadership of the broad field of all the sciences.

The badges of the honorary societies represent talent, ability, stern intellectual honesty, a desire and a capacity to advance, as individuals and as representatives in fields of vital human progress. Those of us whose work falls within the broad bounds of the pharmaceutical sciences feel the vital elements of the human capacity of progress no less than do the workers in any other field. It is an outstanding fact, and one worth emphasizing at every opportunity, that our students who are honored by selective honorary societies have ideals and traditions, capacities for hard work and sacrifice for the

common good; they hold the pharmaceutical torch ever higher lest superstition, ignorance and apathies mar or destroy our progress toward greater achievement.

Pharmacy in Ancient Babylon-Assyria, Palestine and Egypt*

GEORGE URDANG

University of Wisconsin

In the Kremers-Urdang *History of Pharmacy*[1] the story of pharmacy in the Ancient Near East, in Ancient Babylon-Assyria, Palestine and Egypt, is dealt with in a rather cursory way. The reason for this fact is that there was no "pharmacy" as a profession of its own or as a definitely specialized branch of medicine in the early civilizations. The dealing with and in drugs in Antiquity and even in the Early Middle Ages can be regarded merely as a preliminary stage, or, as the Kremers-Urdang book puts it, as "early backgrounds" of what developed as "pharmacy" within the Western world since the beginning of the 13th century.

If, therefore, the average student of the history of pharmacy as well as the interested layman is sufficiently informed by the survey mentioned, the teacher certainly will like to be given some more material.

The old civilizations growing up in the Tigris-Euphrates plains were in spirit superseded, not continued by the Greeks. It was a world very strange to and remote from the Western World of today. Its languages were lost and it was not until 1844 that the first serious attempt at translation was made by the Dane Westergaard.[2] Today we have a rather fair concept of the general political development of the ancient world between the Tigris and Euphrates. We have, however, still much more information to gather as to the details, especially as to the cultural life of the peoples concerned. It may well be said that as to medicine, for instance, some of the concepts held until the beginning of the twentieth century had to be discarded.

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Our knowledge of details has been enriched considerably after the deciphering during the last decades, of a great number of Babylonian-Assyrian clay tablets. We have to bear in mind that, although Babylon was the older and Assyria the younger political unit, they may be regarded as one group as to their main racial elements and their cultural concepts. Some achievements, e. g., the invention of a system of weights and measures originated with the older group, the Babylonians[3], for others, e. g., in medicine, the younger group, the Assyrians, have to be given credit.

"It is to R. Campbell Thompson", says Warren R. Dawson,[4] "that we are indebted for most of our knowledge of Assyrian medicine . . . In 1906 he commenced a systematic study of the medical texts and at once came to the conclusion that the material must be worked over as a whole, and that to continue isolated fragments would lead to no solid result. Accordingly he set to work to collect, transcribe, and study this great mass of tablets, a task which occupied many years and which was interrupted by the World War [No. 1]. Some 660 tablets in the British museum, nearly all of them previously unpublished, were examined and collated, and the cuneiform texts issued in a series of 107 plates by Campbell Thompson in 1923. Having published the texts, the next step was to translate them, but before doing so, another and very important point had to be settled and this is best described in the author's [Thompson's] own words:

'The work of editing so many texts is a long business; and it became obvious, when I got about them again after my return from the War, that the old method of leaving the vegetable drugs unidentified, or translated haphazard, would lead us nowhere. No satisfactory translation of these texts was possible until the plants had been in some measure worked out; and to this end I spent a large part of two years at work on the 250 vegetable drugs known to the Assyrian botanists.' "

I am quoting this report about the admirable work done by R. Campbell Thompson for two reasons: first, because this citation gives convincing evidence of the difficulties of fundamental historical research and the precaution to be taken in drawing conclusions and attempting generalizations on the basis of fragmentary findings; second and primarily, however, I quoted Dawson's statement as to Campbell's marvelous work in such detail because I think that this passage is apt to fill the student with awe and to instill into him respect for devotion to work, the only objective of which is the enrichment of general knowledge, the broadening of the human horizon.

To pharmacy R. C. Thompson's Assyrian Herbal[5] is of special interest. Since there could not be expected a great number of buyers for a book like that and the printing of this

highly technical study would have been rather expensive, the publication has not appeared in print but as a mimeographed reproduction of the handwritten manuscript and in a restricted number of copies.

Thompson gives the following figures as to the kind, number and occurrence of the Assyrian drugs mentioned in the material investigated by him:[6]

Drugs	Species	Occurrences
Vegetable	250	4600
Mineral	120	650
Other and unidentified	180	630

He mentions furthermore alcoholic beverages, various fats and oils, various parts and organs of animals, honey, wax and various milks as being used medicinally.

Thompson does not content himself with the listing of the vegetable drugs which he found on the hundreds of clay tablets he subjected to his research. He arranged all those mentioned more than five times according to the frequency of their appearance, thus conveying an idea of the role which these drugs played within the Assyrian materia medica.

In the following an extract of the best-known of the vegetable drugs listed by C. R. Thompson is given. The numbers are those of the original list of Thompson's designating the relative frequency of appearance. The identification of these drugs is according to Thompson either absolutely definite or highly probable.

1. Pine turpentine; 3. Rosa; 6. Calendula; 8. Styrax; 10. Sinapis; 11. Galbanum; 13. Hellebore; 14. Myrrha; 16. Asa fœtida; 19. Acorus Calamus; 20. Ricinus; 22. Mentha; 24. Fœniculum officinale; 26. Solanum; 33. A. Papaver-Opium; 33. B. Glycyrrhiza; 35. Laurus; 36. A. Pomegranate; 41. B. Mandragora; 48. A. Artemisia; 48. B. Cannabis; 48. C. Conicum maculatum; 51. Balm of Gilead; 53. A. Linum; 56. B. Nigellum; 61. A. Anthemis, Chamomila; 63. B. Juniperus excelsa-Manna; 63. C. Trigonella Fœnum Græcum; 68. A. Crocus, Saffron; 72. B. Thymus; 78. C. Gum-Pitch-Tar; 82. D. Ruta; 87. C. Carduus.

Of pharmaceutical modes of application used by the ancient Assyrians, Thompson mentions juices (inspissated) of medlar tree, pomegranate tree, apple, fig, almond, lemon, poppy, licorice; waters of solanum, aroglusson, rose, fir-turpen-

tine, tamarisk, costus, dates, pomegranate and tar. Fumigations, cataplasms, enemas, powders, pills, ointments, plasters, medicated oils and medicated honeys were also employed.

In a second book, a mimeographed typewritten manuscript published in 1925, R. C. Thompson has collected material as to the chemical knowledge of the Ancient Assyrians.[7] Here he deals particularly with the preparation of glass, colorless as well as colored, by the Ancient Assyrians. Many, if not even all of the minerals mentioned in the first century A. D. by the Greek Dioscorides in his famous book on materia medica were apparently known and used by the Assyrians. However, here the statements of R. C. Thompson are less specific than in his herbal. "A more detailed collation of these mineral drugs (for that is what many of them are)," he says, "will, I think, reveal a pharmacopœia, widely extended into the fields of practical chemistry."

It is of interest that according to Meissner in Sippur of the Hammurabi time (about 2250 B. C.) the retailers in drugs seem to have executed their trade in a special street.[8]

It is stated in the Kremers-Urdang, History of Pharmacy[9] that "magic" played an important part in Babylonian-Assyrian and Ancient Egyptian medicine. In this connection the following explanation of magic in medicine, given by R. C. Thompson in another book,[10] may be of interest for the teacher of the history of pharmacy:

> "In all magic three things are necessary for the perfect exorcism. First the Word of Power, by which the sorcerer invokes divine or supernatural aid to influence the object of his undertaking. Secondly, the knowledge of the name or description of the person or demon he is working his charm against, with something more tangible, be it nail-parings or hair, in the human case. Thirdly, some drugs, to which was originally ascribed a power vouchsafed by the gods for the welfare of mankind or some charm as amulet, or in the broadest sense, something material, even a wax figure or 'atonement' sacrifice, to aid the physician in his final effort. Almost all incantations can be split into three main divisions, each with its origin in these three desiderates".

The prescription of several kinds of filth is thought to be caused by the expectation that, disgusted, the demon may leave the body of the patient concerned.[11]

The Babylonian-Assyrian gods, whose names are mentioned most frequently in the incantations interspersed among the prescriptions, are Ea and Gula. A. Castiglioni describes

the Babylonian-Assyrian deities to whom special healing powers were attributed, as follows:

> "Ea was the special divinity of medicine, but an important part in medical mythology was also played by the goddess Ninchursag, to whom were related eight other divinities, each able to cure a special disease. The god Ninurta had the special rank of azugallûtu, chief of physicians, and was accompanied by his wife, Gula; another medical god was Ninazu, the lord of physicians and his son Ningischzida; their attribute was the rod and serpent. The serpent Sachan was venerated as a symbol and as a healing god." [12]

There is some difference of opinion among the historians concerned as to the degree of "magic" to be attributed to Babylonian-Assyrian medicine. There is, however, no dispute as to the fact that Egyptian medicine on the whole can be regarded as less dominated by metaphysical concepts, although "there is a greater similarity between the Assyrian and the Egyptian medical texts"[13] and there are epochs in which the magic elements in Egyptian medicine gained in amount as well as in importance.

The Egyptian papyri pertaining to medicine which thus far have been translated, edited and commented upon were written in the period from about 1900 B. C. to about 1100 B. C. They are listed in the Kremers-Urdang, History of Pharmacy.[14]

It has to be borne in mind that the translations or at least parts of them are still disputed and will have to undergo many changes before they will be recognized as final. For instance, quite recently Chauncey D. Leake[15] stated as one of the results of the work done by him, Dr. S. V. Larkey and Dr. H. F. Lutz that the opinion of many medical historians as to the number of "incantations" contained in the so-called Ebers and Hearst Papyri is based on the misinterpretation of the Egyptian hieratic characters concerned.[16] The same author states that "it has been a difficult problem for Egyptian scholars accurately to identify the many plant and animal materials recommended for medicinal purposes in the Egyptian papyri."[17] The therapeutically most important Ebers papyrus was edited in 1875 by the man after whom it was named, the German Egyptologist George Ebers, and translated into German by H. Joachim as early as 1890. This translation that has formed the basis of most of the statements as to Ancient Egyptian therapy, has proved to be inaccurate besides leaving many gaps. It is for this reason that Owsei Temkin calls

Cyril P. Bryan's translation of Joachim's German text into English[18] "an anachronism rather than an advance."[19] In the meantime, however, in 1913, Walter Wreszinski prepared a transcription of the ancient manuscript which offered a new basis for translation and interpretation and it was on the basis of this transcription that, in 1937, B. Ebell prepared another translation of the Ebers Papyrus into English that was published in 1937.[20] This translation too and especially the conclusions drawn by its author are by no means generally accepted by the historians of medicine and science and the Egyptologists. Thus Owsei Temkin writes as follows:

"The identification of many names of diseases, symptoms and drugs by Ebell is the result of long labor . . . Yet even on superficial reading of the translation, one becomes doubtful as to the reliability of these identifications. In most cases they are mere conjectures . . . " [21]

Temkin concludes that after "further philological as well as detailed medico-historical investigation" has cleared the field, "perhaps, it will be possible to say more about the origin, general character and influence of Egyptian medicine."

There is one papyrus, the so-called Edwin Smith Papyrus, which has been translated and commented upon so masterly by the former pharmacist and later Egyptologist, James Breasted, that the requirements of Temkin seem to be met to a rather great extent. However, since this papyrus is devoted exclusively to surgery, it does not help our knowledge of the drugs of the Ancient Egypts.[22]

The modes of administration used in Ancient Egyptian therapy are listed in the Kremers-Urdang, History of Pharmacy. As to the drugs, I quote from C. D. Leake:[23]

"Identified plant remedies occuring in the Ebers and Hearst Papyri include acacia, anise, barley, castor bean, wormwood, coriander, cucumber, cumin, date, fennel, fig, fig-mulberry, garlic, gourd, juniper, leek, lettuce, lotus, peas, poppy seeds, saffron, sunflower, styrax, terebinth, wheat, willow buds and white thistle . . . . . Included in the medical writings are references to such mineral remedies as alum, copper, felspar, iron oxide, limestone, red ochre, sodium carbonate, sodium bicarbonate, salt, stibnite, sulphur and possibly arsenical compounds . . "

Leake mentions furthermore frankincense and myrrh. "Beer, milk, wine and honey are the common vehicles for most of the prescriptions containing more than one ingredient. Honey is recommended as the excipient, or binding agent for such combinations as were to be rolled into pill form by the fingers. While a large number of different types of drugs from animal sources are recommended in the medical papyri, their use was apparently not as extensive as plant drugs . . . Excrements

of various animals appear occasionally . . . Wax is extensively recommended . . . for use as a vehicle or binding material, in various ointments or preparations for applications to the skin or wounds. A number of alkaline powders are recommended, to be derived from such sources as wall brick, limestone, builder's lime, clay and gravel. Soot and charcoal are recommended for skin application, burns or itchings."

Another observation of C. D. Leake is of interest. He states that in some cases the scribe copying prescriptions simply combined a number of single ingredients recommended in the original for the same condition as separate and individual prescriptions. This procedure may, says Leake, "have contributed to the rise of polypharmacy."

It is remarkable that in the majority of Egyptian prescriptions the quantities of each drug are stated while in the Assyrian texts this detail is mainly lacking.

As to the history of drugs, the use of which can be traced back to Ancient Babylon-Assyria and Egypt, Warren R. Dawson has published a series of articles in the American Druggist in 1925 and 1926.

Although being of an exclusively medical nature, the statement of A. Castiglioni may be quoted that "the Egyptian concept of life differs from that of Assyro-Babylonia in that, while the latter regarded the liver as the centre of the blood supply and the seat of life, the Egyptian found the most important and most characteristic vital function in respiration."[24]

Summarizing we may say (and tell our students) that our knowledge of medicine and what could be called pharmacy in Ancient Babylon-Assyria and Egypt is still far from being complete, that however, we know many interesting details furnishing an idea of the materia medica concerned and the modes of administering the drugs employed and proving the infiltration of empiric achievements into later and different civilizations almost independent from the change in general concepts and principles.

As to Palestine, the situation is much simpler, although from a pharmaceutical point of view less interesting. Medical thought among the people of Israel differed from the Babylonian-Assyrian concept because it, although likewise theurgic, centered around one and only one supernatural power, represented by one and only one God, and the idea of purity of body as well as soul was made one of the most important

features of daily life as well as of religion and medicine. Thus it is no wonder that hygiene and diet developed in Ancient Israel to an hitherto unknown degree. "Certain traces of this concept," says A. Castiglioni, "can be found in Assyro-Babylonian medicine. But in Biblical law the religious and the hygienic concepts approach each other more and more closely and often merge."[25] While A. C. Wootton states that "among the Israelites the priests did not practice medicine at all" and considers this assumed fact as one of the most remarkable differences between the Egyptian and Hebrew medicine,[26] A. Castiglioni is of the opinion that "the art of healing was reserved for priests" and thus "the people of Israel did not have professional physicians, though an empirical medicine naturally flourished beside the priestly medicine."[27] The difference of opinion may be explained by the fact that Wootton bases his statements essentially on the revised King James version of the Pentateuch, while A. Castiglioni follows modern interpretations of the Hebrew original.

M. F. Ashley-Montagu, stating that there exists no completely faithful translation of the Pentateuch, says that "the King James version . . . is excellent enough as a literary translation but it abounds in mistranslations and errors which completely alter the sense or obscure the meaning of many original passages."[28] In this connection it is of interest that wherever the word "apothecary" appears in the original King James version, in Exodus, 2 Chronicles, and Ecclesiastes, it has been changed generally to ointment cook or crusher (pounder) respectively. There was no profession of pharmacy and, therefore, no "apothecary" in Ancient Palestine. It may be mentioned that a book on "Medicine in the Bible" based on the original Hebrew has been published by Charles J. Brim in 1936.[29]

As to the materia medica of the Ancient Hebrew people, it was in kind and scope, essentially the same as in Ancient Babylon-Assyria and Egypt. The drugs of the Bible have found a rather sufficient enumeration and explanation in Wootton's Chronicles of Pharmacy.[30] Berendes includes in his list of drugs used by the Ancient Hebrews those mentioned in the "talmud."[31] The books known by this name were completed in the 4th and 5th century A. D. and destined to regulate the entire conduct of life of all Jews, of those living in the diaspora as well as of the comparatively small number still

inhabiting Palestine. They are definitely Hebrew but by no means exclusively "Palestinian". Berendes gives furthermore a detailed explanation of the weights and measures employed by the Ancient Hebrews and, as he states, taken from the Babylonians. Since most of the drugs used in Ancient Palestine belong to the vegetable kingdom, valuable and authentic information can be found in Immanuel Löw's "Die Flora der Juden" (The Flora of the Jews).[32] In the volumes of this book, containing a total of about 1900 pages, the learned botanist and Hebraist has given the history of all plants that somewhere within the realm of Judaism gained any importance. Unfortunately there does not exist an English translation.

The fact that the same drugs can be found in the materia medica of the different peoples inhabiting the Near East is easily explained by the fact that there was a continuous trade in drugs already at a very early period between them extending to Persia and India and even China. In a number of murals found in excavated temples near Karnak (Upper Egypt), an Egyptian naval expedition to Arabia is perpetuated which took place about 1800 B. C. The hieroglyphic inscription explaining the pictures tells that the ships brought to Egypt, among other substances, precious woods and franc-incense and cassia bark.[33]

This survey has deliberately been given as a critical one, showing that considerable research has been and is still going on and that we have to be careful in using earlier interpretations of the materia medica of the ancient peoples concerned as sources. Among the literature quoted are books and booklets which are rather inexpensive and which could be acquired even by libraries with restricted funds, for instance, the books of W. R. Dawson, especially that one published within the series "Clio Medicine". The excellent Ciba Symposia can be received for the asking from Ciba Pharmaceutical Products Inc., Lafayette Park, Summit, N. J.

As far as a general introduction to the history of the Ancient Civilizations of the East is concerned, I refer especially to L. Delaporte's Mesopotamia and James Henry Breasted's History of Egypt, the former quoted in this lecture, the latter in the Kremers-Urdang, History of Pharmacy. As to the history of the Ancient Hebrews, a special reference seems scarcely necessary. The book concerned has served for many

centuries and every more precise interpretation, based on modern research, only enhances its beauty and importance: it is the Bible.

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Needs and Opportunities for Trained Pharmacognosists*

ELMER H. WIRTH
University of Illinois, College of Pharmacy

Pharmacognosy is essentially an applied science. As such it involves the application of disciplines from many of the fundamental sciences including chemistry, physics, botany, zoology, physiology and pharmacology. Because of this broad involvement of differing scientific principles, a great many variations occur in the instruction in pharmacognosy. One teacher may stress the chemical, another the biological and still another the botanical viewpoint. It would seem therefore that, in the fundamental training of the pharmacognosist, greater attention should be paid to the question of balance. Certainly the histological characters of a plant drug are of no greater importance than the chemistry of its constituents.

Teachers of pharmacognosy seem to have been more concerned with maintaining a sufficient number of credit hours required in their college curricula than they have with the actual training of pharmacognosists. It is not the intention of this paper to discuss the pharmacognostical needs of the retail pharmacist, but in passing, it should be said that his instruction must include at least the fundamental principles,

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to enable him to form an intelligent conception of the nature and use of the plant and animal drugs. Certainly the student mastering only such a course cannot be considered as a trained pharmacognosist. He needs, not further instruction of the same type, but further instruction in related subjects, chemical, botanical and agricultural, as well as in the more advanced fields of pharmacognosy. Because of the lack of this information, trained pharmacognosists have not been available when opportunities have presented themselves.

In 1941 when shortages in certain drugs became acute, two large concerns were in the market for trained pharmacognosists upon whom they could depend for the production of these drugs. One company finally employed an agronomist and the other a horticulturist when they found that there were no pharmacognosists available, trained in drug plant cultivation. These companies were therefore forced to use men with little knowledge of plant drugs, their nature, their characters, their requirements or their usage. These two incidents may at first seem shocking, but after all they are illustrative of the general picture. Very nearly one hundred percent of the vegetable drugs on the market are produced without the supervision of a pharmacognosist. Compare this with the other branches of pharmaceutical endeavor. How many chemicals are produced without the supervision of a chemist, or how many biologicals without the supervision of a bacteriologist? Who, then, is to be blamed for this lack of trained pharmacognosists but the teachers of pharmacognosy themselves?

The Food and Drug Administration also suffers from an acute lack of trained pharmacognosists. Perhaps fifty percent or more of the vegetable drugs passing through interstate commerce do not meet U.S.P. and N. F. standards. They are apparently not seized and condemned because the Administration seems to have no men trained in the detection of adulteration or the recognition of inferior quality in plant drugs. During the period between 1935 and 1940, I had occasion to examine 47 samples of powdered capsicum. All were labelled Capsicum, U.S.P. Of the 47, one met the requirements of the Pharmacopœia. The other 46 were not even *Capsicum frutescens*, so easily identified microscopically by the epicarp tissues. The illustration can be carried over into many other drugs. How many of the drugs that you

order each year for your laboratory instruction in pharmacognosy meet the standards of the U.S.P. and the N.F.?

Even the pharmacognosists, on the revision committees of the Pharmacopœia and National Formulary, are reluctant in raising standards that would insure drugs of better quality. We wonder why some of the vegetable drugs have fallen into disuse. Is it not because we lack trained pharmacognosists to produce vegetable drugs, to make the standards and to enforce them? There is no lack of opportunity for the trained pharmacognosist, but there is a definite lack of properly trained pharmacognosists.

What then are the needs in the training of such an expert? That is a question to which teachers of pharmacognosy must give their earnest attention. At the University of Illinois we have given considerable thought to this problem and while our plan may not be perfect in all respects, it does offer some interesting possibilities in the training of pharmacognosists.

The curriculum of the College of Pharmacy, as revised in 1941, offers instruction in five major fields: retail pharmacy, hospital pharmacy, pharmaceutical chemistry, pharmacognosy and food and drug. The first two years of instruction are fixed and are the same in all of these divisions. The subjects covered during the freshman and sophomore years include general chemistry, qualitative and quantitative anaiysis; zoology, pharmaceutical botany and pharmacognosy;[1] English, algebra, trigonometry, physics and hygiene and the introductory courses in pharmacy and manufacturing pharmacy. At the end of the sophomore year the student must select one of the five majors mentioned above. If he elects to major in pharmacognosy, he replaces some of the courses in pharmacy and chemistry with special courses in pharmacognosy during the junior and senior years. He still must elect organic chemistry, the chemistry of synthetic drugs, drug assaying and plant chemistry; physiology, pharmacology, bacteriology, and operative pharmacy, all of which enable him to receive the degree of Bachelor of Science in Pharmacy and to take the state board examination for registered pharmacist if he so desires. In addition, the following special courses in pharmacognosy are required: advanced pharma-

[1]This course in pharmacognosy includes didactic and laboratory instruction and covers all of the drugs of vegetable and animal origin in the U. S. P. and N. F. It is considered to be sufficient to meet the pharmacognostical needs of the retail pharmacist.

cognosy, chemical microscopy, microscopic technic, commercial pharmacognosy, microscopy of foods, microscopy of technical products and the microchemistry of plants. These additional courses offer the basic training in the techniques of scientific and applied pharmacognosy and form the ground work for further graduate training in pharmacognosy.

The graduate school offers instruction leading to the degree of Master of Science and Doctor of Philosophy, with a major in pharmacognosy. Courses are offered in the advanced anatomy and physiology of the vascular plants, in the taxonomy and genetics of the flowering plants, in drug plant cultivation, in genetics and plant breeding, in the pathology and entomology of drug plants and in bioassaying and advanced pharmacodynamics. A greater portion of the work is practical and is done in the field and in the greenhouses at the University's medicinal plant farm, which is operated in conjunction with the Department of Horticulture's Experiment Station in Cook County, Illinois. Contact here with agronomists, horticulturists, geneticists, plant pathologists, and entomologists offers an excellent opportunity in the solving of many research problems.

A program of this type seems to meet all the needs of those seeking specialized training in pharmacognosy.

In conclusion, may I repeat again that there is no lack of opportunity for pharmacognosists at the present time. There is, however, a distinct lack of trained pharmacognosists so necessary to the production of vegetable drugs, to their improvement and standardization and to the enforcement of these standards. As adequately trained men appear on the scene, other and greater opportunities will present themselves; opportunities in a drug plant industry, such as has never been developed in the United States because of the lack of properly trained men and of research. Pharmacognosy should look up, not down; forward, not backward. How far and how rapidly it will advance depends directly upon you, as teachers of pharmacognosy.

Results of Applying Semimicro Methods in Freshman Qualitative Analysis*

GLENN H. BROWN and FRANK A. ANDERSON
University of Mississippi

The application of semimicro methods in freshman qualitative analysis has become widespread during the past few years. Now that we are in the midst of an "all out" war—when time is short and materials are scarce, or rapidly becoming so—there will undoubtedly be a greater interest in this field than there was in the past. Although a large amount of material dealing with semimicro qualitative analysis has appeared in literature, little information is available concerning the actual results or the experiences gained by those teaching the subject. It is the authors' purpose in writing this paper to discuss their experiences in teaching semimicro methods of analysis in a freshman chemistry course. Although the results presented in this paper only represent a year's experience at the University of Mississippi and are admittedly of a preliminary nature, it is felt that their presentation may be of interest to the freshman chemistry teachers who are considering the adoption of semimicro methods in their courses.

When the decision was made to introduce semimicro qualitative analysis as part of the freshman chemistry course, it was also decided that only a small percentage of the class should be permitted to take this new course. This meant that part of the students would work on the semimicro scale while the remainder of the students worked with the usual macro qualitative procedure. Running these two courses simultaneously proved to be an interesting experience and, in addition, provided much of the information necessary to write this paper. The remainder of the required information was taken from the results obtained by a group of students enrolled in an advanced course in semimicro analysis. These advanced students had previously had a course in macro analysis.

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* This paper was prepared for the Conference of Teachers of Chemistry at the 1942, Denver meeting.

The procedure used in the semimicro course was approximately the same as that used in the regular qualitative course with the main exception that the volumes of the solutions and unknowns were reduced to 5 per cent or 1/20 of the volume used in macro analysis. For example, if a volume of 10 ml. was called for in a macro procedure only 10 drops was used in the semimicro procedure. Since one drop is approximately 0.05 ml., 10 drops would be 0.5 ml., or 5 per cent of 10 ml.

In general, although the amounts of chemicals used differed widely, approximately the same number and kinds of reagents were used in both of the courses. Students in both sections received unknowns of the same concentration (10 mg. of the ion/ml. of solution), the students in the macro section receiving between 20 to 30 ml. of the unknown, the semimicro students only receiving three to four milliliters of the unknown. (These volumes are sufficient for carrying out three complete analyses.) The advanced students (those taking semimicro after previously having had the usual macro course) received unknowns containing one milligram of the ion per milliliter of solution.

If the results of all the unknown analyses performed by the students in the three groups are averaged the following figures are obtained:

Freshmen students—
Macro section —65%
Semimicro section —70%
Advanced students —69%

All of the analyses were graded in the same manner:

Analysis grade, in percent, =

$$\frac{\text{No. ions correctly reported}}{\text{No. ions in unknown} + \text{No. ions incorrectly reported}} \times 100$$

The figures representing the averages of the analyses are very interesting. Although the semimicro average is five points higher than the macro average, it is undoubtedly due to the fact that a somewhat better grade of student made up the semimicro class. Therefore, to all intents and purposes, these two averages are the same. This means that the introduction of semimicro methods of qualitative analysis did not appreciably influence the accuracy of the students' analyses. The relationship between the 69 per cent average obtained by the advanced students and the other two averages is also

interesting but very difficult to interpret because of the number of factors involved (for instance, the concentration of the unknowns given to the advanced students was only 1/10 of the standard unknown concentration, etc.).

To save time and to offer an easier method of comparison the following observations made by the authors are divided into two parts (1) the overall advantages and (2) the overall disadvantages of semimicro qualitative analysis—with respect both to the course itself, the way it was given, the results obtained, etc.

Advantages.

1. Many of the semimicro operations (centrifuging, washing, etc.,) can be performed in such a short time that the student is able to complete his analysis much more rapidly than he would be able to using the macro procedure. This enables him to recheck his results more frequently and with more ease.
2. A shorter time is spent on each analysis. The student is therefore able to complete more analyses during the semester.
3. Each analysis may be completed in a relatively short time and therefore there is less carry over from one laboratory period to the next. Consequently, the student is better able to integrate his work and his interest is maintained throughout the analysis. This makes the laboratory work less tedious.
4. The student develops a better technique in handling solutions and reagents since he must be careful in handling the small quantities of substances used in a semimicro analysis.
5. The student has a better chance to use and develop his own initiative and ingenuity in making the different pieces of glass equipment needed for the course such as extracting pipettes, medicine droppers, etc.
6. The laboratory work may be more rapidly completed and thus more time may be spent in the classroom teaching the theory of qualitative analysis.
7. The amount of chemicals used is small, the amount required being less than 10 per cent of that required for macro analysis. This is important for two reasons:
   (a) The operating cost of the laboratory is decreased.
   (b) The decrease in the consumption of chemicals helps national defense by conserving important materials.
8. Smaller volumes of solution are used than in the macro procedure and therefore the instructor or laboratory assistant has to spend less time in making up solutions. Thus he can spend more time working directly with the students.
9. The cost of semimicro equipment is much less than the cost of

macro equipment, the total cost of equipping each locker amounting to only about $3.00 per person.†

10. **The students taking the semimicro course develop a better technique by the end of the semester.**
11. **The volumes of irritating or obnoxious gases present in the laboratory are greatly decreased.**

Disadvantages.

1. **Because of the speed with which an analysis may be run, the student has a tendency to rush thru his work with the result that his observations are not always carefully made.**
2. **Some students get in the habit of rechecking their analyses too often and therefore waste time.**

(When considering these advantages and disadvantages it should be remembered that this entire discussion deals only with the results of the adoption of semimicro methods to the usual macro procedure.)

Summary.

The adoption of semimicro methods of analysis in the usual freshman macro qualitative procedure has proved to be very effective, the resulting advantages more than outweighing the disadvantages. Increased speed of analysis, decreased laboratory operating costs, increased student interest, better laboratory conditions and increased efficiency of instruction firmly establish the value of this method of analysis.

The above facts agree with the results observed by one of the authors in the freshman laboratory at Ohio University.

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†Locker equipment is as follows:

10 (10 x 75 mm.) Pyrex test tubes
2 Small watch glasses
1 Spot plate
1 Micro burner
2 50 ml. beakers
1 100 ml. beaker
1 50 ml. Erlenmeyer flask
1 10 ml. graduated cylinder
2 Medicine droppers
1 Small funnel (micro)
2 Crucibles (micro or 000)

A test tube rack, made in the Chemistry building shop at slight cost, is also provided the student. This cost as well as the cost of non-returnable items, is not included in the above figure of $3.00.

The Objectives of the Conference of Teachers of Pharmacy*

EARL P. GUTH

Ohio State University

I have always been interested in the Conference of Teachers of Pharmacy because it was here that I gained a number of excellent ideas on what to teach and how to teach it. I have also enjoyed participating in the discussions from the floor and from the platform, yet I was never quite satisfied with the conferences as a whole.

As I view these conferences, they should have at least a threefold purpose.

First: They should be a clearing house for pedagogical ideas. The experiences of teachers should be voiced so that others may use them, thereby increasing the efficiency of their work.

Second: The conferences should be a place where the subjects classified as pharmacy are discussed in detail with the idea of continuous improvement to meet the demands of the profession.

Third: The conferences should, after thorough study and discussion, make recommendations to the parent body or to the curriculum committee for desired changes in the curriculum. These recommendations should not go unheeded, for who should be better qualified to make constructive suggestions than the teacher of the particular subject.

In general these three points constitute what might be called a long range program for the conference. Pharmaceutical education, as I see it, is far from what is desired; yet I realize that under the conditions that have existed in the past few years it has made rapid progress. When we realize that the transition from the two and three year courses to the four year courses has taken place in our lifetime we must admit that great progress has been made. I believe, however, that we now have had sufficient experience to re-examine the entire pharmacy division of our educational program and make necessary adjustments so that it will more nearly meet the needs of the profession.

In preparing this year's program I made a canvass of many teachers of pharmacy, asking of them the following questions:

* This paper is the address of the chairman of the Conference of Teachers of Pharmacy prepared for the 1942 meeting at Denver. The committee report and the fine papers which follow were also prepared for that meeting.

1. What are the teachers of pharmacy doing to train the pharmacy student for pharmacy as it is being practiced today and may be practiced tomorrow?

2. Are the courses in pharmacy schools presented with the idea of developing the student's ability to meet the problems of the profession?

3. Are the pharmacy schools as modern as the profession?

4. What are some of the modern conditions that the pharmacist must be trained to meet? We give a partial answer to this question.

(a) The modern pharmacist must be able to evaluate, pharmaceutically, chemically, and pharmacologically drugs and medicines, official and non-official, in order to be of genuine service to the associated health professions and to the public.

(b) He must possess a knowledge and training that enables him to comprehend the factors in proprietary products as relates to compounding, storage and stability, and merit.

(c) He must possess the ability and training that enables him to be abreast of the progress in medicine. The pharmacist is being called upon to supply information as well as medicinal supplies.

(d) He must have ability and training that is required to handle small-scale manufacturing with machinery. This is especially necessary for those engaged in hospital pharmacy.

(e) He must have vision and possess the ability and training to contribute to the progress of the profession.

(f) He must be alert to the changes in the profession so that he can adjust himself readily.

There may be other factors of modern pharmacy that should be listed and many of these factors may be taken care of in our schools at the present time. Again there are those individuals who would be able to meet all the challenges of the profession in spite of any training that they receive. However, it is a common complaint and one stressed very strongly by President Evans at the Detroit meeting, that the modern pharmacy graduate is not as well trained as he should be. Similar complaints have been voiced by employers of graduates all over the country in every branch of pharmacy.

The result of this canvass of teachers of pharmacy is found in this year's program. We have invited men in specialized branches of the profession to present their ideas as to what they think the modern graduate should have in the way of training. Each of their ideas may be quite biased and it would be impractical for the colleges to do everything that they suggest, but we should hear them with an open mind. I am convinced that some modernization of the material in

pharmacy subjects is necessary. By hearing these men we may be able to get a clearer conception of the profession and some idea of the changes we should consider. If we are going to discuss course material with any degree of practicability, we certainly should have a thorough knowledge of what the demands of the profession are.

I suggest the following recommendations:

1. That a system of officer promotion be evoked for this Conference of Pharmacy Teachers. The policy of electing an entirely new group of officers each year is not conducive to carrying out a long range program. Officer promotion policies have been used in other divisions of this annual meeting for some time with good success.
2. We recommend that the Long Range Program Committee be composed of three members, each member being appointed to serve three years, the terms of office being arranged so that only one member be retired each year.

A Long Range Program for the Conference of Teachers of Pharmacy*

RALPH E. TERRY
University of Illinois

A careful study of the programs which have been presented at the Conferences of Teachers of Pharmacy since 1925 brings out many interesting facts. The tendency towards formalizing these programs has been going on independently from year to year. With the appointment of a Committee in Long Range Program at the 1941 meeting in Detroit, the Conference sets a plan for the future, and this report is for the purpose of accomplishing the ground work for such a step. Because the membership of the Conference changes from year to year bringing into the group new persons who may have more and better ideas of the possibilities for the Conference, a note of caution should be inserted at this point concerning this report. No program planning at this date can do more than anticipate some of the future developments; adoption of the report then should be considered as a directive rather than as a mandatory action upon future officers of the Conference.

* This report of the Committee on Long Range Program was prepared for presentation at the 1942 Denver meeting by the chairman.

With this fact in mind, the following recommendations are now offered for action by the present Conference:

Be It Recommended:

1. **That a uniform policy of unit topics be established for the major portion of each Conference program.**

(Discussion: Note that the term, "major portion" is used here with the meaning that over half the topics should be on one general subject. It would be a mistake to omit some discussions which might not fall into this subject classification, two very good reasons being: a—the sameness of subject matter would tend to become tiresome; and b—it might very easily prevent some of the casual attendants of the stimulation of the "extraneous" subjects. A great many of the younger men for example attend sessions of the Conference only occasionally; to rob them of a somewhat rounded meeting might be very disadvantageous. The officers must decide the value of the terms, major and minor, as employed here in the light of their opinions as to the desirability of the topics offered.)

2. **That for the immediate future, the following schedule be used by the officers in planning the programs:**

1943—Operative or Galenical Pharmacy Courses.
1944—Dispensing Pharmacy Courses.
1945—Undergraduate Elective Pharmacy Courses.
1946—Graduate Pharmacy Courses.

(Discussion: An attempt has been made to set up a program for a four year period. The workability of the Long Range Plan will be demonstrated by the end of the period and its faults corrected. A certain degree of flexibility must be maintained even with the topics outlined above.)

3. **That due consideration be given to the assignment of topics so that a wide range of subject matter can be presented at any one conference. Overlapping of topics should be prevented by careful selection of titles and a clear understanding of the material to be presented by each participant.**

(Discussion: This recommendation is self-explanatory. A careful outline of the extent of the material an assignee is expected to present will do much to prevent repetition. While, in some cases, the presentation of the topic from a number of viewpoints woul be advantageous, again this leads to wasteful discussion. It would be better to limit formal presentation to a rather short period of time, leaving more time for discussion to settle points of difference.)

4. **That special emphasis be placed on having all those present taking part in the discussion compatible with the availible time. The younger teachers should be encouraged to enter into the discussions by careful control of the presiding officer.**

(Discussion: One of the current comments of the younger men is that they would like to say something but the presence of their elders causes them to hold back. A tactful presiding officer may overcome this by securing the names of the younger men from their colleagues and then

calling upon them. This should do much to give the younger men the feeling that the Conference belongs to them as well as to the constant attendants.)

5. **That those persons especially interested in some phase or part of a topic be invited to exhibit and demonstrate the subject in which they are interested.**

(Discussion: At the very first formal meeting of the Conference, back in 1925, Dean Newton presented an exhibit of material in connection with prescription pricing. Unfortunately, this practice was not continued. It could be revived to considerable advantage provided that such exhibits would be formulated with due regard to their temporary character. Demonstrations always are of extreme interest, and if both forms be kept simple, much good can be obtained from them. The enthusiasm of the exhibitor or demonstrator will count for more than the most ornate display.)

6. **That serious consideration be given to arranging an additional Conference period.**

(Discussion: A single session has proven insufficient time to cover the range of topics. While the present program arrangements have been built up over a period of years, there is no reason why changes cannot be made and all Conference groups be allotted an additional period. Perhaps the most logical time would be Monday evening after the usual dinner and speaker program now in vogue.)

7. **That a joint program of all conferences be established to discuss questions of general teaching methods and other items of interest to all faculty members. The Conference of Teachers of Pharmacy should lead the way in this step.**

(Discussion: While it is true that a number of topics of general interest are discussed at the regular sessions of the college body, they are often sandwiched in between administrative discussions. The proposal here is to extract these and presnt them as a unit, leaving the executive matters to be handled in a single session. While it is possible that various terms may be applied such as deans' session vs. teachers' meetings (and even more ribald names), such a plan should be of advantage.)

Our Experience with Intensified Courses of Study*

RUDOLPH A. KUEVER
State University of Iowa, College of Pharmacy

A priceless item today, in this total war effort of our nation, is time. Every activity of value in the war program has been or is being accelerated. Education, the bulwark of

*Written at the request of the Editor.

democracy, is no exception. Like all other phases of national defense, education is moving more swiftly.

Profound and sweeping changes in the nation's systems of education, affecting virtually every high school, college and university youth over 17 years of age, have been announced in recent weeks. Acceleratd programs of training are now in operation in several hundred colleges and universities throughout the nation. In many high schools also students are participating in the plan.

At Iowa the College of Pharmacy is participating in the plan for the following reasons:

1. To fully utilize the entire calendar year—making maximum use of the usual vacation periods to enable students to complete the standard course in less time.

2. To give students an opportunity to complete basic and in some cases advanced courses in military training; the basic military training course having long been required as a prerequisite for graduation. A student who satisfactorily completes it by the close of the sophomore year and elects to take the advanced course in military training may receive a commission in the Officers Reserve Corps at the time of graduation.

3. To enable a larger number of students to complete their training before being called by the defense forces of the nation, and to enable those students because of special training, to better serve their country. Shortly after Selective Service became effective the State Advisor on Occupational Deferment for Iowa agreed that all students in the College of Pharmacy, who are recommended by the school authorities for continuance in the College and who are within one year of graduation, and in special cases within two years of graduation, be recommended for deferment. To justify this deferment there could be no interruption of school attendance, excepting very temporary ones. Vacations from June to September were considered more than temporary interruptions and were out for the duration. Local boards were instructed to reclassify students who did not pursue their course of training on a year-around basis.

4. The College of Pharmacy at Iowa is an integral component of the University. Its courses of study are geared in that way. It meshes courses with the Colleges of Commerce, Dentistry, Liberal Arts and Medicine. It would not be pos-

sible to have the usual standard courses in chemistry, zoology, physiology, bacteriology, pharmacology, biochemistry, to name only a few, and not have the course of study in the College of Pharmacy operate at the same tempo as those in other colleges.

The University adopted the intensified program of study on May 11, 1942. Its future course was determined when the Navy decided to establish on the campus a pre-flight training school and the Army a pre-meteorological training program. These two courses include nearly 3000 men and officers who are making full use of the facilities of the University.

At Iowa the College of Pharmacy has completed two terms (formerly semesters) on the intensified program. In retrospect it may be said that, as a war measure, there is nothing visibly, fundamentally very wrong with it as an undergraduate program. Both quality and quantity of work remains the same as that previously given under the four-year arrangement. The number of clock hours for lectures and laboratory periods remains unchanged. The work in instruction is not curtailed. Life is more strenuous, however. The work is more arduous—the demands greater. The days are longer. For the summer term of sixteen weeks, classes were begun at seven in the morning, central war time. Responsibility of faculty and students is greater, but responsibility educates. There is complete and thorough cooperation. The esprit de corps is excellent. It is a matter of keeping together for progress, and working together for success.

The facilities and resources of the College of Pharmacy are in operation in 48 of the 52 weeks. There are only four weeks of vacation, two weeks at Christmas time and one week each between the other two terms.

When the accelerated program was adopted 96 per cent of the students, then in attendance, elected to pursue it. At present all students are in the accelerated program because that is the only one in operation.

It should be said however that a year-around program of teaching is only fit for the emergency, for the reason that when the country is at war, the entire nation is at war and not only the uniformed defense forces.

In times of peace the four-year program has many advantages. There is a definite relationship between education and

leisure that is difficult to define. To accomplish most there must be some leisure in educational processes. The process of education knows what to do with leisure because it has been brought up with it. And in this connection it is important not to confuse a life of leisure with a life of laziness. In intensified programs there is insufficient time for browsing and for the cultivation of the imagination.

The summer for practical experience in drugstores and as a source of financial aid for the ensuing school year has taken on a new importance for both the student and the drugstore owner. And when peace returns once more it is certain that in Iowa students in pharmacy will again utilize the summer months largely as they have for more than three-quarters of a century until the mad men of Europe made it necessary for us to fight for our way of life. The former four-year program which combines the formal courses of pharmaceutical education with a certain amount of leisure and several months of practical experience in a drugstore each summer has much to recommend it. We need, in due time, to return to it. The blend of the three, in proper proportions and of apropriate quality, constitutes balanced and rounded experience. And of all the numerous teachers holding classes on this earth, experience is the most valuable one. It is on the basis that experience is not what happens to a student but what he does with what happens to him that makes it the most valuable schoolmaster.

As a program for postgraduate work, in the pharmaceutical area, the intensified course of study at Iowa has been almost a total failure. While we expected and were prepared for about 15 advanced students we have only been permitted to keep four, the defense forces taking the rest. Perhaps the opinion now so frequently expressed—that there will be ample time to split the atom when the war is over—may be correct. In any event it is not the desire to set forth those pros and cons here in these brief remarks.

Pharmaceutical Education from the Standpoint of Colleges of Pharmacy

ERNEST LITTLE
Rutgers University

I am very much pleased to be permitted to speak for pharmaceutical education on this occasion commemorating the one-hundredth anniversary of the founding of the Maryland College of Pharmacy, now the School of Pharmacy of the University of Maryland.

My feeling on this occasion is one of unusual humility. I am humble because it seems impossible to attend a function of this kind at the Maryland College of Pharmacy without realizing that you are standing on ground where great men in the field of pharmaceutical education have trod and, as a matter of fact, where such men are still operating.

Dr. A. G. DuMez, your present dean, is recognized as one of the men in the field of pharmaceutical education who has made a really substantial contribution to our program. Under his direction the college has been strengthened in every department, and the financial support received from the State of Maryland has been greatly increased. Dr. DuMez has developed a teaching staff which is recognized as exceedingly strong. He has also developed a sound graduate program. We find more graduate students enrolled at Maryland than at any other college of pharmacy in the United States. These students have not been recruited or sought after. They have come to Maryland because they felt that they could obtain no better graduate training than is here offered, and they were not incorrect in their opinion.

Dean DuMez is not a man to be satisfied with past progress, no matter how profound such progress may have been. I am certain that under his guidance the Maryland College of Pharmacy will go on to greater heights and will continue to provide the dynamic leadership which it has exercised in the field of pharmaceutical education during past years.

I have not felt it necessary to painstakingly investigate the early history of the college which we are today honoring,

*Read at the Centennial Celebration of the University of Maryland, School of Pharmacy.

before writing this paper, and I do not want you to feel that I have exercised undue faith in so doing. Anyone who has played even an average part in the development of pharmaceutical education during the past twenty years is familiar, in more than a general way, with the present status of the college and the remarkable progress which it has made, and cannot fail to appreciate the clear, accurate vision which has directed its development and the fine spirit which still motivates all of its activities.

The Maryland College of Pharmacy stands high on the list of American Colleges of Pharmacy. This is as it should be, and certainly does not excite wonder or even any special comment. Any other condition would be incompatible with the high standards of the University of Maryland and would be quite unacceptable to the officials administering this great university.

In this connection may I express a word of appreciation on the part of the American Association of Colleges of Pharmacy for the splendid support which has been afforded pharmaceutical education by the University of Maryland and by the State of Maryland as well.

In isolated cases we find great universities lending their name to a college of pharmacy and then withholding the support, financial and otherwise, which properly belongs to it. In some very few instances, the cause of pharmaceutical education has been definitely injured by such an attitude. Naturally big, powerful universities, state supported or otherwise, possess great prestige and exert a wide influence on other colleges. Any undue hesitancy on the part of such educational leaders to take the proper step is misunderstood by some, capitalized upon by others, and regretted by many. In any event, the effect of such an attitude is always injurious, much more so than the delinquent university may realize.

It is always gratifying to learn of a great university assuming responsibility for pharmaceutical education, but it would be well if such responsibility was not assumed until the university is able, or will soon be able, to throw its full influence definitely in the direction of progress. An orphan college operates at a great disadvantage. It does its best work and makes its greatest progress when it is possessed of a real alma mater.

The University of Maryland has been a real mother to the Maryland College of Pharmacy and has made it possible for the men responsible for its administration to do a real job, and full advantage has been taken of these opportunities. The Maryland College of Pharmacy might have made substantial progress under less favorable conditions, but it could never have attained its present position of leadership without ample assistance from the University and the state in which it is located. It is impossible to pay tribute to the Maryland College of Pharmacy without paying equal tribute to the University which has made its recent progress possible.

If I know this group to whom I am speaking, correctly, there is not much concerning pharmaceutical education which I can tell you that you do not already know.

You know of the truly remarkable progress which has been made in this field during the past two decades. You have witnessed how, under the leadership of the American Association of Colleges of Pharmacy, our colleges have progressed rapidly from the two to the three year course in 1925, and to the minimum four year course in 1932.

You have seen entrance requirements raised, teaching staffs strengthened, library facilities increased, equipment and supplies multiplied, until today our program compares very favorably with those being carried on in other university colleges.

It is, of course, true that much still remains to be done, but the framework is fundamentally complete and rests upon a foundaion which is adequate and secure. There will always be finishing and altering and polishing to be done. These processes are important and will be given adequate attention, but the basic job is completed and, providing it is maintained strong and secure, should serve our purposes for many years to come.

There are those among us, few in number, who contend that we are now ready for the fifth or sixth year of pharmaceutical education. Some contend that such additional work should be given in our colleges of pharmacy; others claim that two years of pre-pharmacy work should be required of all entrants, during which most of the cultural subjects will be taken, thus leaving four solid years for the presentation of strictly professional subjects.

Your speaker definitely disagrees with these viewpoints. He recognizes that our educational program must be continually strengthened, but feels that four solid years of pharmacy college work, supplemented by practical experience in a drug store, provides adequate training for the retail pharmacist of today.

There is, however, an increasing demand in the manufacturing field, in research, and in the teaching profession, for men of more advanced training in pharmacy. Such men can be best prepared by a program of graduate work such as we find in operation at the Maryland College of Pharmacy.

Although the need for Doctors of Science and Doctors of Philosophy in the field of pharmacy is real, it is hoped that no college will attempt a graduate program until it is in a position to do a thoroughly creditable job.

There are few things more regrettable than sub-standard graduate work. The establishment of a graduate program is a goal which all colleges should have before them, but which should not be undertaken prematurely. The sending of poorly equipped graduate students into the manufacturing and research fields of our industry would greatly injure the prestige of our colleges of pharmacy. May we proceed cautiously, if not slowly, in the development of our graduate work, stressing quality rather than numbers and appealing only to such students as can take full advantage of the opportunities offered to them.

Although it is the responsibility of pharmaceutical educators to vision, so far as possible, the future development of retail pharmacy, I do not feel that I can predict with certainty just what that development may be. I have talked with those who professed to know, but as I listen to their exposition I become more and more convinced that they are mistaking desire for vision and indulging in more than an ordinate amount of wishful thinking.

It is essential, however, that pharmaceutical educators should have a very definite objective in this connection toward which they are working and exerting their influence.

It is reasonable to assume that the pharmacy of the future will be of a more professional nature than that with which we are now familiar. Would it not be appropriate for pharma-

ceutical educators to exert their influence in that direction? As a matter of fact, are they not already doing so?

The adoption of the four year course has made it possible for colleges to turn out graduates who are prepared to greatly enlarge their professional services, both to the physician and to their customers as well. We have given them the tools with which to work and we have striven hard to develop in them the initiative and the imagination which will enable them to take full advantage of such possibilities.

Indeed, our colleges have done more than that. We find their staff members active in organizing and operating interprofessional relations committees designed to promote greater cooperation between pharmacists, physicians, and dentists, to the end that their patients might be better and more economically served.

Your own Professor Andrews has demonstrated how effectively such a program can be carried out. I have his card index of formulas and prescriptions compiled by the U. S. P.—N. F. Publicity Committees of your state on my desk at all times, and assure you that I have frequent occasions to refer to it.

As neighbors, you know that New Jersey has not been laggard in this important work. I am pleased that our college has been able to play an important part in such activities. Cooperative enterprises of this sort among the practitioners of the various professions should be continued with increasing enthusiasm. Such work is definitely in line with the patient's welfare and should prove a potent factor in increasing the professional nature of the pharmacy of tomorrow.

Another service which colleges of pharmacy are offering in the interests of the profession is the presentation of extension courses for older men, men already in the field, graduates who have not been able to enjoy all of the advantages and privileges which are offered to pharmacy students of today.

At Rutgers these courses were carried on for two years as refresher courses of a somewhat inspirational nature. We found they performed a useful service. This year we substituted extension courses of a somewhat more profound nature. During the first semester we offered a course in physiology, including laboratory work, which was especially designed to meet the needs of men already in the field. During the second

semester we presented a course, with laboratory, in Modern Dispensing Pharmacy. Both courses were well received and proved helpful to those enrolled.

I mention these two courses merely because I am familiar with them. They are in no way unique. Many colleges offer much more extensive programs than we have found possible at Rutgers. Colleges, generally, are doing their utmost, not only among their undergraduates, but among their alumni and in many other ways, to make the pharmacy of tomorrow a more dignified, more serviceable, and a more highly respected profession than it has been in the past.

Proper cooperation between colleges and the profession will do much to accomplish this end. May we go forward with mutual confidence and trust, each exceedingly critical of himself and his own activities, but not too critical of the other fellow. That is the attitude which inspires confidence. It is the attitude which promotes cooperation and makes real progress possible.

Colleges of pharmacy shall never lose sight of the importance of the responsibility which they have assumed, that of turning into the ranks of the profession well trained, broadly educated men of character. We do not claim to be working perfectly, but also feel that we have no reason to be ashamed of our accomplishments. We have set our goal and shall not be easily dissuaded.

May I close with the words of Carl Schurz, who helpfully commented, "Ideals are like stars; you will not succeed in touching them with your hands, but, like the seafaring men on the desert of waters, you choose them as your guides, and following them reach your destiny."

We are all convinced that our objectives are worthy ones and can be obtained. May we at these dedicatory exercises, rededicate ourselves and our lives to the task of making pharmacy an evermore useful, and more highly respected profession.

That has been the spirit of the Maryland College of Pharmacy during the century of its existence. We are happy to assemble here this afternoon, not merely because this college, which we are honoring, has lived a long time, but rather because it has lived well and because we are convinced that it will live even better in the years to come.

The Kilmer Award Pays Dividends

CHARLES W. WENDT*
Ohio State University

This summer I have been in high clover:—graduation in June; state board examinations immediately following; practical work in a prescription store during July; and finally, as a climax, the Kilmer award in August with its coveted trip to the National Convention. No better city than Denver could have been chosen for the convention as far as I was concerned; even the speed of the streamlined Burlington Zephyr seemed slow, but eventually I arrived on schedule, and made straight for the headquarters hotel.

Upon registering and receiving the official badge and convention program, I took a look around the rooms where the various sections were to be held and I had a feeling that the convention had captivated me. The first meeting I attended was the American College of Apothecaries. I decided on this section because Dr. B. V. Christensen was giving the opening address. I had studied throughout my senior year under Dr. Christensen at Ohio State University, but this time his lecture took on new significance because I felt that I knew him personally. As I met the other men attending the meetings, I was surprised to find that with many of them that same feeling of knowing them personally was present as it was with Dr. Christensen. After all, they should have been familiar to me, some of them were authors of books I had studied in school, articles I had read in the journals; they had perfected techniques and processes that I had worked on in the laboratories; their names were seen regularly in the Journal as officers of the organization. These men were the spirit and essence of pharmacy. To be able to be among them, to absorb some of their enthusiasm, hear their discussions, and see the way they carry out the work of the organization was a rare privilege.

Perhaps I was fortunate in being able to attend the best convention that had ever been held. This seems to be the opinion of others with whom I visited. Enthusiasm ran high. Perhaps the accelerated pace was due to the press of wartime problems and the growing importance of organization

* Member, Ohio State Student Branch, A. Ph. A

which is being recognized in pharmacy. Certainly it was to me a revelation of the place which the profession has attained and the scope which the work of the A. Ph. A. covers.

How does all this relate to the student of pharmacy? Where does he fit into the picture of a national standpoint like the A. Ph. A.? What are the possibilities of his first-hand association with the leaders and members of the organization? These questions have been asked by students who are approached for membership in their respective collegiate branches. Aside from the purely local activities of the home group, what can be done to promote fraternal spirit and professional respect between the junior branches and the parent organization?

It is my opinion that the answer to these questions presents itself clearly in the activities of the annual meeting of the A. Ph. A. and its affiliated organizations. There can be, and should be, a definite place in these meetings for representation of the junior groups. Delegates are sent from the various state organizations, from state boards, scientific groups, faculty groups, professional retailers, manufacturers, and hospitals. Why not the student group—the group from which all the others eventually emerge?

The junior A. Ph. A. is only just begun, but the movement has spread rapidly. Twenty accredited schools now have active branches. Next year the number will grow. In any group of earnest young people working together for a common cause, problems will arise which are not easily solved. Certain talents appear which deserve to be allowed to expand. New ideas pop up which could be used to advantage by other similar groups. How better could these several factors be correlated and used to the mutual advantage of all the branches than by a junior representative group at the annual convention?

There is much to be learned at these meetings. The future leaders of the profession can draw heavily from the present ones in viewing the ways and means by which national problems are attacked. There is, furthermore, an inspirational value of no small measure which can be carried back to the local groups.

You students engrossed in your learning, busy with your classes, up to your ears in pharmacy books, have you ever

stopped to consider your authors, your deans, your faculty, the state board members, the men who make the wheels go around in national pharmacy circles? They are living personalities, intent on the progress of pharmacy, and charming in their individualism. They are the educated men upon whom the future of the profession rests, and the finest examples from which the student may gauge his own possible attainments. These men convene yearly to discuss the problems and decide the policies which will aid you in your careers, certainly they will welcome the opportunity to accept the representatives of one of the groups for which they labor.

Student delegates can be chosen within their own groups on the basis of outstanding attainment, initiative and ability. Expenses can be defrayed from student funds set up for that purpose. A competitive spirit of scholastic achievement will be fostered within the groups, and a greater interest in branch activities will be shown as the result. Is not all this as integral a part of pharmaceutical education as learning the apothecarial arts?

The groundwork of such a movement has already been laid in at least one section of the country. District Number Four of the boards and colleges of which Ohio State University is a part, held a meeting last year at Purdue University at which the representatives of the student branches convened. At that time, one of the group, Robert Gordon of Purdue, was appointed to represent the section at the national convention in Denver. But one Bob Gordon is not enough to constitute a junior representation. Why not have all the Bob Gordons from all the sections of the country present?

A project of this nature rests squarely in the hands of the students. Only through the initiative of the individuals and the concerted efforts of the groups, can this sort of movement be accomplished. It is an effort which is bound to pay dividends in the form of increased interest in national organization and pride in professional standing. Pharmacy needs the kind of young men who would be chosen to represent the school branches. Let us have a worthwhile group of these representatives at the 1943 meeting.

Training Pharmacists for Retail Pharmacy*

MARVIN J. ANDREWS
Read Drug and Chemical Company, Baltimore

To write a paper on "Conditions of Pharmacy in the Metropolitan Areas," the subject assigned me by the secretary of your section, is a broad subject for a war period when conditions are abnormal. With this thought in mind, I have taken the liberty of changing my subject to one more pertinent to the times, that is the "Training of Pharmacists for Retail Pharmacy".

It is not so much the condition of pharmacy in the metropolitan areas now, or in the future that will be the real problem to be considered by the retail pharmacist. I will admit certain types of merchandise and drugs are difficult to obtain and will become more difficult as the war continues, but that will be only one grave problem. The real one is to be able to obtain sufficient trained help to operate a store, but as your section and the American Association of Colleges of Pharmacy are interested only in the pharmacist or pharmacy student, I will confine my comments to the future need for professionally trained pharmacists.

Under normal conditions, the present number of students that are being graduated annually is not sufficient to take care of normal replacements. Retail pharmacy is now faced with a definite shortage of registered pharmacists due to the demand of and at the same time has the added responsibility of taking care of the health of the increase in population in the industry centers. The increase in Baltimore is said to be something over 200,000.

This acute situation will require the cooperation of all pharmacy groups to interest more students in pharmacy as a vocation. Undoubtedly after the war there will be many pharmacists returning to civilian life and seeking employment. Nevertheless, there will be many openings, not only in retail, but in the many other fields of pharmacy. What the condition will be in the next five years will be dependent upon the number of students entering our colleges. This is a problem that should be given a great deal of thought by both the retail pharmacist and the college.

*Prepared for the Conference of Teachers of Pharmacy for the 1942 meeting at Denver.

Since leaving the field of teaching, I have had an opportunity to observe the graduate after he has begun his practice work. President Evans in his address last year said, "The pharmacy graduate is not as well trained as he might be." The average graduate has a good background as far as fundamental education goes, but of course he is not capable of going into retail pharmacy and performing the duties expected of an experienced man. It is my opinion that if the colleges and the boards and the practicing pharmacists will cooperate, the training of the young pharmacist can be greatly improved.

During the last year I have worked with 107 registered pharmacists, some of whom are now in the armed forces. Among these men were graduates from nine different colleges of pharmacy and two older men that became registered before the law requiring graduation from an accredited college of pharmacy became effective. In addition, I have observed twenty-four students that our company employs in its stores during the summer to obtain a part of the practical experience required by law. From these observations, I am presenting a few thoughts for each group to think about in the educating of future pharmacists.

The College of Pharmacy

The student entering the college of pharmacy is a high school graduate, but is not old enough to realize the value of many subjects included in the curriculum. This is particularly true if he has previously worked in a store where the pharmacist in charge thinks in terms of yesterday instead of tomorrow. The freshman still likes to play and unless he is properly guided, he will fail. The same student may have made an excellent pharmacist if he had been properly handled from the beginning.

The best way to prevent such conditions is for the dean in each school to talk to the freshman class sometime during their first week in school. In less than an hour he can tell the class the value of each of the various subjects in the curriculum and how each subject lays the foundation for others to follow. If this is done in the proper way, the students will see the value of the subjects. In those cases where the dean is unable to give valid reasons for the inclusion of any particular subject, that subject is not important and should be dropped from the

curriculum. Such a procedure would tend to stop criticism from the retailer as well as from the student.

The playful student, the student that is not extra bright or has not had the proper foundation in high school, has to be treated in a different way. A wise dean will check up early on his students at specified intervals and find out why they are failing or why they are trouble-makers. This will require a great deal of time on the part of the dean, as it takes personal consultations, but it is time well spent.

One of the chief difficulties a young graduate has is to apply the knowledge he acquired in his basic courses to the practical compounding of a prescription. He gets a prescription and is at a loss to know what causes a precipitate or how to overcome it. In other words, he has not been taught to apply the knowledge he has gained. This raises the question as to whether his teachers have correlated their lectures with the laboratory work and the student fails to get the application. This is very apt to occur when one instructor conducts the class work and another the laboratory. However, if this is done, the instructor giving the lecture, regardless of the subject should spend some time in the laboratory to observe the work of the student. I also believe it is time well spent for instructors and deans to visit a number of stores frequently in order to keep in touch with what is going on in practical pharmacy.

To illustrate this point let me take you on a trip through ten drug stores and point out a few simple things in which the school can help a great deal. When we have finished the trip we will have seen some good and bad stores and we may have the following notes:

1. The glasses at the fountain where we had a soft drink and a milk shake were not clean. Some of the critics may ask, "What has this to do with professional pharmacy?" Students are being trained for all types of stores and many stores have fountains. Aside from the appearance, this is definitely a public health problem, and reflects on the student's bacteriological training.

2. One store had a great many crude drugs, some of which were mouldy, musty, and worm-eaten. This will illustrate the change in type of medication of today as compared with yesterday. This problem touches on such subjects as botany, pharmacognosy, and economics.

3. The clerk behind the drug counter needs a shave, has on a soiled coat, and the floor is littered with tabs from the cash register. Some will say,—What has this to do with the college? With these notes go

back to your college and inspect your own students in the various classrooms and laboratories and see if you do not find the same conditions.

4. The notes on the prescription department reveal that the knife edges and the pans of the balances are dirty, the sink is filled with dirty apparatus, cigarette butts are on the floor, the counter and bottles in general are dirty. On examining several prescriptions that have been wrapped and were waiting for the customer to call, we noted that a bottle containing a lotion did not have a "shake" label; the label on a capsule prescription had a typographical error and the letters were blurred indicating the type on the typewriter needed cleaning. Looking over some prescriptions on the file we find the pharmacist had failed to make the proper notes on the blanks, such as typing in the names of illegible ingredients or directions, the size of the capsule used, and the manufacturers' names. Take a survey in your laboratories and you will no doubt find the same conditions.

To a great many this imaginary trip has been a total loss of time because they were not interested in these so-called minor details, yet unfortunately these are the factors used by the general public to judge the profession as a whole and not the guilty individual. The colleges can help a great deal in the training of the future pharmacists by watching such details. It will not be an easy task, as it is difficult to break bad habits, but it will make a definite improvement in the present graduates. In addition, the college group will not only keep in contact with conditions in retail pharmacy, but will be in a better position to give retail pharmacists a great many helpful suggestions in terms which they can understand.

The State Board of Pharmacy

Previously I have stated that all groups have a definite part in the education of the future pharmacist. The state board of pharmacy contacts the student only for a short time, yet there is a great deal of work to be done by each member of the board. The selection of a board member should be given a great deal of thought. A man may have been a pharmacist in a small store for twenty years, yet he may not have had the experience of another man that had only been in pharmacy for two or three years. Then again certain individuals will accept the appointment for the honor or prestige the position bestows, and will fail to do their part of the work. These factors will have a tendency to retard rather than improve the young pharmacist that has just graduated.

From my experience in the meetings of the district groups, I have found that a great many individuals think their particular setup is perfect. These groups are typical of those men who think in terms of yesterday, they have forgotten that an individual is never too old to learn. To illustrate this point, I will forget about all the theoretical subjects given by the boards and discuss only the practical pharmacy examination. To begin with the average candidate is under a mental handicap and is at a distinct disadvantage. In some states he is given only one chance to fill a prescription or make a preparation, yet I doubt if every man on the board under the same conditions would consider this fair. When the examination is complete, the examiners look over the contents of the container with a high-powered reading glass to find the flaws and give a grade. The sad part about the whole thing is they have failed to watch the man at work, which is the important part of the examination, and the examiner in most instances would know the ability of the candidate. Again it is not fair to have one board member observe one group while another member observes another group, as this brings in personalities, which can only be ruled out by having all members observe the candidates and taking an average of all the grades. The Maryland Board of Pharmacy has a method for giving and grading the practical examination which is fair to the candidate, and when the examination is over they can show the candidate exactly where he is weak.

One of the big problems for the board group is the question of practical experience, and cannot be solved overnight. There are no definite standards for practical experience and it will be a difficult task to formulate such standards. Some students are raised in a drug store, and by law have all the experience in terms of years they need, but may not be as well qualified as another student that has only worked for six months following a systematic program. To formulate such a program will require the cooperation of all groups, especially the retail pharmacist.

The Retail Pharmacist

The members of the state board of pharmacy have the final say when it comes to evaluating the practical experience of a student, yet what have they to go on except a sworn statement by the pharmacist in charge that the student has worked for a

definite period of time in a store where prescriptions are compounded. Many such students have never been behind the prescription counter, while others know nothing about the other departments in the store. It is the pharmacist's responsibility to see to it that his store becomes a tool in the education of the young graduate.

Earlier in this paper I stated that twenty-four students were working in the company's stores during the summer months to obtain practical experience, and you will be interested in what they learn. These men, consisting of first, second, third, and fourth year students, are being used as guinea pigs. To obtain credit for the experience they all have to follow a definite program, which I will outline briefly. The program is divided into three definite parts.

The first part is based on the actual work the student does in the store. A report based on fifteen questions asked of the student, is sent in to the office every two weeks by the pharmacist in charge. These questions touch on such items as: the general appearance of the student, his ability to grasp information, approach toward a customer, ability to make displays, neatness of the department in which he works, and the number of prescriptions he has read.

The second part consists of questions issued every two weeks for the student to answer in a notebook. The questions have to do with the different departments which are found in the average drug store. These include the candy, cigar and cigarette, cosmetic, patent and drug, and the prescription departments, and the soda fountain. The student is required to answer an average of two questions a day.

Once each month all the students are called into a central place for two-hour discussion or demonstration. Such items are taken up as the correct technique in filling a prescription, the proper method of cleaning a balance or a typewriter, how to change a tank of gas on a carbonator, and how to read a clinical thermometer.

Such a program brings in the problem of personalities which has to be confronted in any group of stores, colleges or state boards. So far it has had a two-fold effect in that the student asks the pharmacists the answers to the questions and as is to be expected, they do not know all the answers. This alone has a tendency to keep the pharmacist up to date, and

as a result he looks at things pertaining to professional pharmacy from a different point of view and is more willing to cooperate.

A program for training the young student to be a capable pharmacist upon graduation, presents many problems that will be difficult to solve. If the entering freshman class is sufficient to make the necessary normal replacements, I personally believe that a satisfactory program can be worked out if all groups will work together and think in terms of five years hence, instead of yesterday. Under no circumstances should the present educational standards be lowered, however, they should be adjusted at definite intervals to keep abreast of the times.

Condition of Pharmacy in Pharmaceutical Associations*

CHARLES HALL EVANS
Warrenton, Georgia

In making a survey of local, state and national pharmaceutical associations one is impressed with the fact that in most instances the men and women making up the profession do not subscribe to the old adage, "In unity there is strength." This survey reveals that the above-mentioned associations are made up of a comparatively small number of their potential members, yet it must be admitted that this same small number represents the real backbone of the profession. It is through the efforts of this group that conditions in pharmacy have been improved in the past few years. This comparatively small group who are responsible for pharmacy's progress have laid well the foundation and under their leadership conditions of pharmacy in pharmaceutical associations have materially improved in every phase of association work, with the possible exception of adequate contacts between affiliated associations and their members.

In our profession we have two types of pharmacists:

(1) The loyal association member, who through love of his profession is embued with a sincere desire to be of service to his fellow man and to bring about better conditions in his business, his community, his profession and his local, state and national associations.

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(2) The non association member who feels that all associations are merely political organizations. He is concerned only with those things which will accrue to his personal benefit. He does not have the inclination or desire to foster better professional relations or to help his fellows.

It is to this non-association member that we should direct our efforts in closer contact work.

That this faithful minority has brought about better conditions in our associations can not be denied. We have witnessed the change in association programs from the almost wholly commercial type to the program where professional pharmacy predominates. Just so have we witnessed the decided swing back to the professional side in many of our drug stores.

It has been a difficult task to get a truly representative group present for state and national meetings. In the rural sections particularly, where the pharmacist as owner with one or two helpers constitute the personnel of the store, it is not an easy matter for him to get away to attend association meetings. However, the newer type association programs of district meetings has brought association activities closer home to these pharmacists and they have shown greater interest in all association work. These district meetings appear to be the solution to increased interest in local, state and national association work. Here officers and contact men bring pharmacy problems directly home to our pharmacists and many of our most loyal association workers are enlisted at these district meetings, who do yeoman service in legislative matters particularly, and in many other phases of association work whose meetings they are not privileged to attend.

This is an age of organization. The value of organization as shown by the strength of organized labor is perhaps responsible for all professions exerting their efforts towards enlisting every worthwhile practitioner of that profession. Our colleges are becoming more and more conscious of their responsibility in equipping their graduates to do more than actually practice the profession for which they are trained. They are directing their efforts towards instilling in their graduates a love of the profession which shall bring out the best in them and thus create a desire to take an active part in professional activities and association work as well as civic betterment in their community, their state and their nation.

Through the A. Ph. A. student branches, clubs, programs at state conventions and in other ways these colleges are impressing upon their graduates the obligation to support our associations and to conduct themselves in keeping with the code of ethics of the profession. This is bound to bring about better conditions in pharmacy and on these young men and women now taking their places of leadership in association work the future welfare of these associations and of pharmacy rests.

Condition of Pharmacy in Manufacturing Companies*

RUSSELL A. CAIN

Sharp & Dohme, Inc.

I deem it an honor to be asked to discuss with you the subject of pharmacy, or more especially the practice of pharmacy, as it relates to pharmaceutical manufacturing. The importance of adequately training those individuals intending to follow the profession of pharmacy is, of course, recognized by all. During the past two decades, the American Association of Colleges of Pharmacy, as well as the teachers in our schools and colleges of pharmacy have constantly strived to raise the standards. This is evidenced by the preparation of the Syllabus and also by the fact that the two-year course in pharmacy was abandoned in favor of the three-year course and the latter supplanted by the four-year academic course culminating with the baccalaureate degree. In view of the broad scientific training that a pharmacist must have in order to adequately follow his profession, it seems that even four years do not allow sufficient time to master the multiplicity of subjects with which he should be familiar. I shall, however, try to point out briefly the advantages of a thorough, well-rounded pharmaceutical education, especially as it applies to pharmaceutical manufacturing and also give some idea as to the responsibilities of the pharmaceutically-trained man in manufacturing plants.

One can hardly help being aware, either directly or indirectly, of the gradual shift from manufacturing by the phar-

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macist in the drug store to the pharmaceutical manufacturer. In years past the manufacture of pharmaceuticals was, for the most part if not entirely, carried out by the pharmacist who took considerable pride in the preparation of his own elixirs, fluidextracts, tinctures, etc., to be used in compounding prescriptions. To do this required considerable time and probably in the majority of cases was not very economical considering the relatively small quantities manufactured in any one particular store. As manufacturers commenced making pharmaceutical preparations, it is not surprising that the pharmacists should welcome the opportunity of purchasing them as needed and in any quantity, large or small. The result has meant not only a financial saving, but also the time formerly spent on manufacturing could be devoted to other activities. The establishing of the pharmaceutical manufacturer, therefore, appears to be a logical sequence in the progress of pharmacy. In assuming this responsibility, the manufacturer must and does prepare his pharmaceuticals with precision and care as did the pharmacist, since for the latter the manufacturing of his own products must have been a source of great pride and joy. Not only has the manufacturer assumed the responsibility of the making of pharmaceuticals, but also is, in cooperation with the medical profession, aiding in the developing of new medicinal products and new dosage forms for new as well as old medicaments. In other words, research plays a major role in the progressive manufacturing plant.

In view of what has been said, I shall attempt to discuss briefly the role of the pharmaceutically-trained individual in the manufacturing plant. The role he plays and the necessity of his possessing a thoroughly well-rounded pharmaceutical education will, I believe, be quite obvious.

The activities of a manufacturing concern may generally be classified as technical and non-technical. The technical phase, in which we are interested at the moment, consists primarily of research, manufacturing and control. Research, whether it be on a small scale or large, with its many ramifications, occupies a most important place in the manufacturing plant. It is responsible for developing new products which means syntheses, the carrying out of pharmacological and clinical tests and their incorporation into suitable dosage forms. For the most part the synthesizing is left to the organic and inorganic chemist, the pharmacological and clinical testing to

the pharmacologist and physician. The incorporating of the product into suitable dosage forms, however, falls directly within the scope of the pharmaceutical chemist. It is quite obvious that in order to properly prepare acceptable dosage forms a thorough knowledge of pharmacy in its broadest sense and pharmaceutical chemistry is of prime importance. Consideration must be taken of chemical and physical characteristics, physical and chemical incompatibilities and many other factors almost too numerous to mention.

In addition to the compounding of new dosage forms, there is, of course, the ever-present job of improving the products already on the market.

The importance of pharmaceutically-trained individuals in the manufacturing laboratories can hardly be over-estimated. Manufacturing fundamentally may be thought of as compounding on a large scale. As carried out on a small scale, as in the store, it was practically a one-man operation in which the pharmacist began and finished the preparation. In large scale operations scores of individuals enter the picture in the handling of the chemicals and crude drugs from the time they are received and on throughout the processing and packaging operations. It is quite necessary, therefore, that in addition to a systematic routine, the key men throughout the manufacturing laboratories be individuals who by scientific training and experience are thoroughly familiar with the chemical and physical characteristics of the chemicals and crude drugs with which they have to deal. It need hardly be mentioned that the utmost care and precision is required in the manufacture of medicinals to obtain the highest degree of accuracy and quality (pharmaceutical elegance). Who then is better qualified to assure and maintain these standards than the individual with a thorough pharmaceutical background and who has acquired in addition those most necessary attributes; namely, accuracy, integrity and the intense desire to see a job well done.

Closely associated with manufacturing is the control which must be exercised not only in connection with the chemicals and crude drugs themselves and products made from them, but also in connection with the packaging and labeling of the finished material. Before any chemical or crude drug may be used for manufacturing it must be sampled and subjected to various tests and assays to establish its identity, quality and

purity. By the same token the products made from these drugs must likewise be sampled and carefully checked and assayed, chemically or physiologically, to assure that they have been properly fabricated and are up to standard from the standpoint of potency, purity and quality. This is the responsibility of the analytical control laboratory whose personnel must necessarily consist of highly trained individuals.

I have pointed out the value of pharmaceutically-trained individuals in research, manufacturing and the analytical control laboratory and have stressed the accuracy and care with which medicinals must be made. It matters little how much thought and care are used in obtaining the final product unless it is packaged so as to prevent as much as possible loss of potency, contamination, change in physical and chemical characteristics due to light, air, etc. The selection of proper containers, closures, etc. obviously requires a fundamental knowledge of both chemistry and physics.

Finally, there is the control which must be exercised in connection with the labeling of a product. This particular type of work requires not only a fundamental knowledge of pharmacy, in the broadest sense of the term, but also a thorough knowledge of federal, state and export laws. To be able to properly label a product, its chemical, physical, and physiological properties must be well understood and fully appreciated. Anyone who has carefully studied the provisions of the Federal Food, Drug and Cosmetic Act as they relate to labeling will "fully appreciate" what I mean.

In this resumé I have attempted to point out wherein the pharmaceutically-trained individual fits into the pharmaceutical manufacturing picture. Were I to have gone into detail it would have been possible to cite numerous other points along the way where the trained individual is of a definite necessity. Although my remarks have been confined to the technical phase of manufacturing, we must not forget that the sales representatives play a major role. To be a good salesman one must possess a thorough knowledge of the products being sold. Certainly a pharmaceutically-trained individual with a general knowledge of the manufacturing and control of the products is most desirable.

I believe, therefore, it must be agreed that the pharmaceutically-trained individual plays a most important part in the manufacture of medicinals which, after all, is only logical.

Sales Promotion in Pharmacy*

RALPH W. CLARK
Merck & Co. Inc.

Sales promotion may be defined as the total of all the activities that contribute to the sale of a product or service.

Pharmacists used very little, if any, sales promotion back when the pharmacy was a small, quiet place, identified by show globes in the windows, where drugs were sold to people who were ill. Today, the majority of pharmacists sell a variety of merchandise, in addition to giving a professional service, in greatly improved establishments with modern fronts and interiors. Although great strides have been made in sales promotion of good products by dramatizing their best features and presenting them in an attractive manner, pharmacists themselves have not made a great contribution compared to the enormous outside sales promotion efforts being devoted to the products they sell. Pharmacists have done even less in presenting their public health service. Most pharmacists are not aggressive in promoting their prescription service, their public health departments, or any other portion of their activities even after they, themselves have decided that one or the other of these departments should be treated differently than simply as another department. The two points to be emphasized are that it is up to each pharmacist to decide which department or departments he considers should be actively promoted, and then he should coordinate advertising, display, and aggressive selling as a regular, planned promotion policy, rather than a casual and uncertain practice.

Pharmacies operated primarily or exclusively as prescription and health merchandise centers, are limited in number and their promotional problems vary considerably from many average pharmacies. On the other hand, many proprietors or managers of so-called average pharmacies are aware of the importance of the prescription department, as well as the sale of merchandise related to it, and therefore actively promote it for the many benefits derived from this excellent source of service, sales, and profit. It seems logical that pharmacy's role in the protection of public health should be vigorously

* Prepared for the Conference of Teachers of Pharmacy for the 1942 meeting at Denver.

promoted, but even recent graduates from colleges of pharmacy lack ability in this field. This may be understood in part at least when we read[1] that on an average only about one hundred thirty-six hours are devoted to courses in pharmaceutical economics, which embrace a number of subjects in addition to the one under discussion, in the four-year course in pharmacy. Further reason for only partial appreciation of fundamental sales promotion principles lies in the well-understood situation illustrated by the example of a recent book on drug store management[2]. Several thousand copies of this book have been sold, but it is generally known that not enough copies have been read and used, although this book and others, too, describe many sales promotion methods which have proved successful. We recognize the value of courses in pharmaceutical economics and the need for such courses in the well-balanced curriculum. We also know that the person who provides the stimulus for reading to pharmacists will be doing the profession a great service. We trust that some leader or group will soon succeed in these fields, thereby rendering a great service to pharmacy.

It has been said[3] that, "Once, the pharmacist manufactured. Now, he largely distributes. He works less with his hands than he did formerly, but he must know more." This concise statement concerning the pharmacist's change from the position of establishing standards, to the dispenser of drugs which are standardized, covers the trend very well. It is true that he must know more to intelligently distribute and promote the sales of the many new products used by the medical profession today. The pharmacist should also know more about better sales promotional practices which will not interfere with the soundness of his professional work, but rather give the public an opportunity to evaluate and appreciate it. Just now the public is very much interested in health problems and there will never be a better time for pharmacists to increase their sales promotion of the products and services they are in a position to supply.

The times will not permit pharmacists to take some steps, modernization for instance, in sales promotion. However, they can do many of the things being done by those who appreciate the importance of sales promotion. Among these ac-

[1] O'Connell, C. Leonard, Am. J. Pharm. Ed. 6:241, 1942.
[2] Nolen & Maynard, "Drug Store Management" McGraw-Hill Book Co. (1941).
[3] Muldoon, Hugh C., Am. J. Pharm. Ed. 6:186, 1942.

tivities are: (With no attempt to list them in order of importance)

1. Improvement of stock.
2. Improvement of appearance of the pharmacy, with special emphasis on the departments to be actively promoted.
3. Promotion to physicians by news sheets, letters and calls, based on quality of potent, standardized products, and the service the pharmacist can offer the physician and his patients.
4. Local newspaper advertising—product and institutional.
5. Package inserts—product and institutional.
6. Window displays—product and institutional.
7. Store displays—product and institutional.
8. Conservation and better use of literature and displays supplied by manufacturers.
9. Becoming better informed on products sold.
10. Over-the-counter selling of the right kind to make the pharmacy a vital force in the community.

The success of a pharmacy depends on sales. If selling fails, profits fail. Certainly then, there is need for continually improved sales promotion to maintain and advance a pharmacy in its competitive activity. There is relatively little sales promotion used by pharmacists, as compared with the practice of other retail store managers. The keys to solving the problem lie in including more and better courses in pharmaceutical economics, taught by qualified teachers, in the college of pharmacy curricula, and in stimulating pharmacists to develop better reading habits.

Condition of Pharmacy in Neighborhood and Suburban Drug Stores*

EUGENE N. BEESLEY
Eli Lilly and Company

Since data were available from reports on the operation of prescription departments and from profit and loss statements which had been submitted to Eli Lilly and Company for analysis, a study of this information has been made in an attempt to obtain some statistical help in formulating an

* This study based upon operating statements and the number of prescriptions filled was prepared for the Conference of Teachers of Pharmacy at the 1942 meeting at Denver.

opinion concerning the conditions of pharmacy in neighborhood and suburban drug stores.

As the basis for the study, reports were used from drug stores located outside the business center in cities of over 25,000 population. In order to obtain information about trends affecting these stores, compilations were made for the years 1937, 1939, and 1941.

Of the total number of drug stores submitting data for analysis, 121 were in the neighborhood and suburban classification for 1937, 146 for 1939, and 88 for 1941. From the statistical point of view, the comparative data would have been more accurate if it had been feasible to base the study on reports from the same stores. However, since only a few stores had submitted reports for all three years, it was considered advisable to use the information supplied by all stores in neighborhood and suburban locations, thereby obtaining a larger sample.

A comparison of the geographical distribution of the drug stores included in the survey with all individually owned drug stores as given by the 1939 United States Census figures is given in Table No. 1. So far as is known, no data are available on the geographical distribution of all neighborhood and suburban drug stores.

Reports on the operation of their prescription departments were submitted by part of the proprietors who sent profit and loss statements for analysis.

In Table No. 2 a comparison is presented of information concerning the prescription department of neighborhood and suburban drug stores, and stores regardless of location. It will be observed that neighborhood and suburban stores filled fewer prescriptions than the average for the other stores and that their prescription revenues were proportionately less. The average price received for prescriptions in both groups of stores was approximately the same.

Reference to the trends shown in Table No. 2 and to the total sales of neighborhood and suburban drug stores (Table No. 3) reveals a surprising condition. Apparently, stores in the neighborhood and suburban classification have failed to participate to the same extent in the general increase in total sales volume, and in prescription business, that has been experienced by stores in other locations.

The average sales volume of neighborhood and suburban

drug stores in 1941 was 3.9 percent less than in 1939. The average number of prescriptions filled declined 18.6 percent and the average revenue derived from them decreased 18.4 percent.

According to the United States Department of Commerce, total sales of independent drug stores were approximately the same in 1937 and 1939, but during 1941, sales increased 18 percent over the 1937 and 1939 levels.

The Lilly Digest of the 1941 Statements of 404 Retail Drug Stores (covering the operations of drug stores of all types and not limited to neighborhood and suburban stores) shows that there was an increase of 19.0 percent in total store sales between 1939 and 1941. The same source indicates that there was an increase in that period in the number of prescriptions filled of 21.8 percent and in prescription revenue of 34.2 percent.

Cost percentages shown in Table No. 3 are approximately the same as the average expenses for store operations given by the Lilly Digests. Furthermore there was little change from 1937 to 1941 in the various items of expense, indicating that most proprietors of neighborhood and suburban drug stores are exercising good managerial ability in keeping their costs in line with their sales volume. Profits increased slightly despite the decline in sales volume. It should be observed, however, that the net earnings of neighborhood and suburban stores are not as high and the increase in profits in 1941 over 1939 was not as great as those reported by the Lilly Digest of the 1941 Statements of 404 Retail Drug Stores. According to the latter source, profits in 1939 averaged 5.8 percent of sales and in 1941, 7.5 percent of sales. Neighborhood and suburban drug stores made a net profit of 3.8 percent in 1939 and of 4.3 percent in 1941.

Table No. 4 gives the trend of neighborhood and suburban drug store profits as compared with the profits of the drug stores reported in the Lilly Digest for 1941. More neighborhood and suburban stores made a profit of 1 to 4 percent of their sales volume than did stores in all types of locations. However, a higher than average percentage operated at a loss and fewer made a profit of over 5 percent. In keeping with the general trend, more neighborhood and suburban drug stores operated on a profitable basis during 1941 than during 1937 or 1939.

It would be unwise to draw too fixed conclusions from this survey because of the comparatively small sample of neighborhood and suburban drug stores which forms the basis for it. Nevertheless, it is believed there were reports from enough stores to give an indication of the trend of prescription business and general store business for stores in this classification.

The study, therefore, raises a perplexing question. Why have not neighborhood and suburban drug stores apparently kept pace with those in other locations, in sales volume, prescription business, and net earnings? One would be inclined to doubt the trend that is indicated were it not for the fact that all the comparisons point in the same direction. The reasons for the comparatively poor showing of neighborhood and suburban drug stores are, of course, matters for conjecture. However, the study points to a very interesting field for further inquiry.

Table No. 1

Comparison of Geographical Distribution of Neighborhood and Suburban Drug Stores Included in Survey with All Individually Owned Drug Stores

	All Individually Owned Drug Stores	Neighborhood and Suburban Stores		
	1939 (U. S. Census)	1937	1939	1941
New England States	7.2%	3.3%	5.5%	6.8%
Middle Atlantic States	22.2%	20.7%	17.8%	20.5%
East North Central States	19.7%	37.2%	32.9%	27.2%
West North Central States	12.6%	13.2%	8.2%	15.9%
South Atlantic States	10.4%	6.6%	8.9%	9.1%
East South Central States	5.9%	6.6%	5.5%	5.7%
West South Central States	10.7%	4.1%	3.4%	3.4%
Mountain States	3.3%	3.3%	3.4%	2.3%
Pacific States	8.0%	5.0%	14.4%	9.1%
	100.0%	100.0%	100.0%	100.0%

Table No. 2

Comparison of Prescription Department Data of Neighborhood and Suburban Drug Stores with Drug Stores in All Locations

	1937		1939		1941	
	30 N. and S. stores	152 Stores in all locations*	59 N and S. stores	345 Stores in all locations*	58 N. and S. Stores	256 Stores in all locations*
Average number prescriptions filled (Including refills)	2,958	4,284	3,874	4,405	3,155	5,106
Average prescription revenue	$2,439	$3,860	$3,565	$4,023	$2,908	$4,761
Percent of total store sales represented by prescription revenue	7.3%	12.8%	11.0%	11.9%	9.4%	13.2%
Average prescription price	82c	90c	92c	91c	92c	93c

*Data obtained from the Lilly Digest of Statements of Retail Drug Stores.

Table No. 3

Trend of Average Sales, Costs, and Profits in Neighborhood and Suburban Drug Stores

	1937 121 stores	1939 146 stores	1941 88 stores
Total sales	$33,522	$32,299	$31,053
Salaries	16.1%	15.9%	15.8%
Rent	3.8%	3.9%	3.6%
Other expenses	7.2%	7.7%	6.9%
Total expenses	27.1%	27.5%	26.3%
Cost of merchandise sold	68.9%	68.7%	69.4%
Net profit	4.0%	3.8%	4.3%

Table No. 4

Trend of Neighborhood and Suburban Drug-Store Profits as Compared with the Profits of All Types of Drug Stores

	1937		1939		1941	
	N. and S. stores	All stores*	N. and S. stores	All stores*	N. and S. stores	All stores*
Loss	19%	13%	23%	14%	11%	9%
Profit 1% to 4% of sales	41%	32%	40%	36%	40%	35%
Profit 5% or more of sales	40%	55%	37%	50%	49%	56%

*Data obtained from the Lilly Digest of Statements of Retail Drug Stores.

The appointment of Charles R. Bohrer of Missouri as assistant secretary of the American Pharmaceutical Association and P. H. Costello of North Dakota to the secretaryship of the National Association of Boards of Pharmacy will bring universal satisfaction to the pharmaceutical profession throughout the country. Both of these men have rendered a distinguished service to pharmaceutical education in their respective states and also nationally. As long as national associations choose as their executives men of such capacity and vision, we need have no fear that pharmaceutical education will not be supported.

Dr. W. W. Charters, formerly director of the Bureau of Educational Research at Ohio State University, has become Chief of the training division of the War Manpower Commission. Back in 1927, it was Dr. Charters conducted the study of the functions of the pharmacists and wrote the report, "Basic Materials for Pharmaceutical Curriculum," which became the foundation for curriculum construction. No man is better qualified to render a constructive service to the War Manpower Commission.

"Of all the great movements in behalf of professional pharmacy, pharmaceutical education is about the only one to keep its course, weather storm, and finally reach safe harbor." Robert L. Swain

Editorials

Pharmacy and the Future

"Praise the Lord and pass the ammunition" is good psychology for the war effort morale and for druggists. We suggest praise the Lord and thank your lucky stars that you are a pharmacist.

History repeats itself and we all remember, or should remember, what happened to business in general after World War I.

Many merchants who had been in business for years in clothing, shoes, ready to wear or other lines folded up when the crash came. Drug stores of course were hit but very few in proportion were put out of business. People must have drugs and business goes on about as usual, war or no war and we may be sure the same thing will continue after the present struggle. Yes, business will change and probably very markedly. No one can predict just to what degree or how. We do know now that government is dictating more and more and what will happen to the little fellow after the war no one knows. We also know that there will be fewer drug stores and that will be a good thing. The weak and incompetent will go and you, if you have ability and vision, will have a better chance.

Some are apparently disturbed because of the slight recognition of pharmacy in the Army and Navy in this war. We had less recognition in World War I. It is no secret that the Medical Corps is the bottle neck. Pharmacy will not be fully recognized, under the present setup until we are able to prove definitely that pharmacy is a scientific profession.

Let us look at the facts.—Pharmacy is judged largely by what people see and we must confess, without argument, that "commercialized variety stores and eating emporiums" called cut rate drugs are not impressive places likely to gain respect for pharmacy.

Drugs and chicken dinners are incompatible and as "*Vituals*" come in, scientific and professional standing goes out of the drug store. These places could not prosper as they have if they were really called what they are. They have stolen a time honored respectable label "Drug Store" and commercialized and degraded it and pharmacy as a whole has suffered.

Some complain of self dispensing by the doctors—again let us look at the facts and not forget the fact that the so-called physician supply house got its toe hold a few years ago when "plugging" courses were rampant to get people by the state boards. Many became fully registered pharmacists without any scientific background and either became very bad competitors or drug store saloons. On this count pharmacy took a terrible licking and is still suffering from its wounds.

But you ask, "Why bring up these subjects." The reason is this; because these conditions could have been largely avoided if human nature could have been eliminated and instead of a half dozen or more groups they had united into one powerful organization which could speak for pharmacy as a whole.

As it is there is lack of team work. Let us hope that after this war someone will appear on the pharmacy horizon with not only the vision but the ability to make this union possible. I believe it will be done.

The associations at the Denver meeting are to be commended for reaffirming their stand on educational requirements. There will be an attempt to break it down on the part of those who want cheap registered help. There is only one thing to do and that is to stand by your guns—no matter what the pressure.

I like to think of pharmacy as applied chemistry, which it is. It may be that out of this war some good may come to pharmacy; hurt pride may spur to unselfish action and bring about a union of all interests so necessary for success. The years ahead will be no time for the timid but for the man who is not afraid; who has faith in himself; has a proper scientific background, and is willing to work. Pharmacy as a profession, in my judgment, still holds a future.

Wilbur J. Teeters
State University of Iowa

A Method of Recruiting Students

The encouragement of worthy high school students to choose pharmacy as a career has always been a desirable, but neglected, project. There is nothing bad in "proselyting"

candidates to our profession. Though this appeal cannot be made on a financial basis, nevertheless, a number of valuable appeals can be made, some of which will bring results.

The following method can, and has been, used effectively. The representative of our profession in each community is the pharmacist, but the impetus for action must come from the school of pharmacy.

The method starts with the preparation of a sample speech by someone within the school of pharmacy. This speech should present the salient facts about pharmacy, such as history, education, opportunities, and facts which will arouse interest. Instructions as to the procedure of matriculation in the school of pharmacy should be included.

This speech is then sent to a progressive pharmacist in each community with a letter of instruction advising him to seek the opportunity of speaking before the graduating class of his local high school. He should be advised to read the sample speech until familiar with it, and then speak from notes, plus his own experience. (In one case the secretary of the state association undertook the responsibility of mimeographing the speech and letter, and the selection of a key pharmacist in each community. In the larger cities, the dean of the school of pharmacy spoke in the high schools.)

This method appears to be advantageous to all quarters. High school students need and appreciate aid in the selection of a career. Modern high schools are anxious to receive aid in the important field of vocational guidance. The pharmacist, though sometimes reluctant to speak publicly, recognizes the service he is rendering his profession, as well as the advancement of his own professional integrity. The school of pharmacy gains by enrollment, which, in these days, is essential.

May the time come soon when our schools of pharmacy can become selective of the students which they admit for preparation in the profession of pharmacy.

(Copies of material which have been tried already may be obtained from the writer.)

E. A. Brecht
University of North Carolina, School of Pharmacy

The Pharmaceutical Educator and the War

The one great immediate task is the winning of the war. The second one is the winning of the peace which is to follow. The troubles of the world today have their roots in wrong thinking. Human thought is the strongest single force in the world. It was God's gift to man. He placed upon man the responsibility of using it beneficiently. Our aims in this war are beneficient and that is the chief reason why we will win, for according to the immutable law, call it natural or spiritual, righteousness and justice prevails in the end. All of us must do our share on the battle front or on the home front, wherever we can be of the most use to our country. As educators we are best fitted to serve most efficiently on that front. Many faculty men have the ability and the opportunity to win fame and higher incomes in a purely military service, but their consciences should deter them from impairing the home front, if they are needed at home. Education is fundamental to our civilization and power, now and after the war, as it always has been. The schools, especially the colleges and universities, have furnished or developed the brain power, not only of civilian leaders and workers, but of military as well. It is strange therefore, that education should ever be given an inferior place in war planning. Education has cooperated in every way to strengthen the war effort. It has done so willingly and efficiently, but by direction and not by a full recognition of its parity with other divisions of our administration. It may be that the exigencies and necessities of war make such equivalent participation in the war councils impractical, and I may be mistaken in believing such equivalency does not exist. At any rate, it is not apparent as far as I can see.

First.—I believe all faculty members who are not definitely needed in some special war service can give as patriotic a service at their present teaching posts as they could as officers or privates, except possibly as members of the proposed Pharmaceutical Corps. Based upon my knowledge of conditions during the last war, and my participation in it in a pharmaceutical educational way, I am certain teachers do not enhance themselves, if that is their only purpose, by abandoning their permanent positions and tenures to seek officer rank and higher emolument for an ephemeral period, with the later difficulty of finding another desirable placement. I knew a number of men, who, on that score, reaped harvests of regret.

Second.—The student situation is unpleasant and still confusing. The uncertainties are wearing on the students, but also for the faculties and the institutions administrations. No one knows exactly what is ahead. The situation we hope will clarify soon, and the indecisions, doubts and fears will give way to definite procedures. In the mean time it seems wisest for students of all ages to go right on with their college work.

Third.—There is encouragement, even certainty, in the larger perspective. The war has passed the turning point in our favor. The outlines of order are less faint. The growing cumulative war efforts are accelerating and must lead to an earlier victory than at first expected.

When the war will have been won, pharmacy will still be as necessary and beneficent as it always has been. There will be as many pharmacists and pharmacies and drug stores and students and teachers and colleges and researchers and organizations of all kinds, as ever. Under their recovered freedom and the new experience gained, they will speed their efforts to a point where the time lost will be more than balanced by greater achievement and reward, all according to the eternal and immutable law of cause and effect. I like the name Emerson gave this fundamental truth. He called it the Law of Compensation. It could also be called A Law of Divine Mind. Some give it the descriptive name: Law of Balance. This law brings great comfort to the minds and hearts of those who accept it, because it explains, in a measure, how God works in dispensing absolute justice to all. This law is basic in all the Scriptures of the world. Many who do not accept the Scriptures acknowledge this law. The thought power of our enemies to win this war lacks the foundation of righteousness, and is therefore in that measure weaker than ours and so they will lose the war. The length of time the law will require to bring the war to the end depends upon the power and impulse we give to our determination to win. The conviction that we will win should encourage us in the meanwhile to have faith in the Law of Compensation and in the Divine order. Such faith should strengthen us to face the future resolutely and unafraid.

Frederick J. Wulling
University of Minnesota

The Pharmacy Corps Bill

There is a bill now pending in Congress called the "Pharmacy Corps Bill."

This bill provides for the establishing of a Pharmacy Corps in the Army, and would place the procurement, storage, testing and dispensing of all drugs and medicines under the direct supervision of graduate pharmacists. Every state in the United States requires a pharmacist to be a graduate of a four-year college course in a recognized college of pharmacy and pass a rigid state board examination before he is allowed to recommend or dispense drugs or medicines.

The Army, on the other hand, takes men from all walks of life and gives them a ninety-day schooling and considers them pharmacists.

Something must be wrong with our institutions of learning if the Army can do in ninety days what a university takes four years to do.

It is obvious by the absence of a Pharmacy Corps in the Army that the Army thinks more of its mules than it does the lives of its men as the Army is very particular in having a veterinary corps to look after the health of the mules. From my own experience in the First World War, I know that pharmacy in the armed forces was then and is now in a deplorable condition and the enlisted men's lives have been and are being jeopardized now by the present slipshod methods of handling drugs and medicines in the Army.

There is not a single drug store in America where drugs and medicines are slapped together and dished out under such abominable conditions, and if the public knew the true condition they would see that it was corrected in short order.

Brig. Gen. L. McAfee, assistant surgeon general of the Army, in opposing the bill, said that drugs used in the Army were chiefly in tablet, or some other prepared form and that little actual prescription compounding was necessary.

"Any intelligent boy can read the labels and dispense them as needed," he said.

Would any intelligent boy know that three 1/30 grain Strychnine tablets would be fatal? Would he know that Fowler's Solution contained Arsenic, a powerful poison, and

that the dose was only three drops, and that half a teaspoonful would be fatal? Would he know that those innocent looking acetanilid tablets were a powerful heart depressant and that an overdose would cause disastrous results? Maybe some of those ninety-day wonders the Army turns out might, but I have my doubts.

Your son, brother, father, husband or friend in the Army has a right to expect and get the same professional health protection in the Army as he does in civilian life. If he were sick wouldn't you feel a lot better if you knew that he were receiving medications prepared and dispensed by a competent qualified pharmacist rather than by one of those ninety-day wonders?

The pharmacist is the doctor's right hand man and the doctors depend upon his knowledge of therapeutics and potent drugs. The health of the public and men in the armed service depends upon the care, skill and eternal vigilance of the pharmacist.

Write or contact your Senators and Congressmen today letting them know that you **expect** them to vote for the Pharmacy Corps bill as the only means of giving the lads in uniform the same type of professional pharmaceutical service guaranteed to them by the pharmacy laws of every state in the United States.

A. Lee Adams,
Glencoe, Illinois.

MARRIAGES

Mr. Robert Wurmfeld, journalist, formerly newspaper correspondent in Vienna, secretary of the International Help Center, whose Youth movement he organized, member of the League of Nations Association and secretary of the International Peace Campaign, now of Kew Gardens, Long Island, and Miss Eva Maria Urdang, daughter of Dr. and Mrs. George Urdang of the University of Wisconsin, on September 19, 1942.

NEW IN THE FAMILY

Lea Gene Gramling, Jr.—Born November 28, 1942, son of Dr. and Mrs. L. G. Gramling, George Washington University, School of Pharmacy.

Bruce B. Brody.—Born November 24, 1942, son of Mr. and Mrs. B. B. Brody, University of Illinois, College of Pharmacy.

Jacob Fulham Skinner.—Born August 19, 1942, son of Dr. and Mrs. Joseph Skinner, Massachusetts College of Pharmacy.

The Editor's Page

"But many that are first shall be last; and the last, first," —"But the meek shall inherit the earth; and shall delight themselves in the abundance of peace,"—are gems of scripture and of truth that ran through my mind when I read in the Loyola Maroon of October 16, 1942 that the Order of the Purple Heart has been bestowed upon Dean John F. McCloskey of the School of Pharmacy of Loyola University.

The reason why there should be such a flow of scriptural lines at this announcement cannot be appreciated unless one knows the meek, the gentle, the lovable, the fighting soul that lives within the body of John F. McCloskey. But one would never get it from the Dean himself, that in World War I, he served the English and French armies and with Australian and New Zealand troops, in the Oise-Marne, the Aisne-Marne, the Chateau-Thiery and the Champagne-Marne sectors. In the last named front he was gassed and wounded. He is a member of the Legion of Honor and received the decoration, La Etoile Norde from the Government of France. The Order of the Purple Heart is the oldest badge of military merit. It was instituted by Washington during the Revolution and has since been awarded to those displaying extraordinary valor in the service of this country.

The award was presented by Mayor J. Lester White, chief of occupational deferments of the state selective bureau. Col. M. W. Glossinger, retired, and commander of the Joseph Newly Chapter of the Military Order of the Purple Heart announced the presentation. The Colonel was an eye witness of the heroic action of Dean McCloskey. The citation said in part—"It was while McCloskey, then a lieutenant in the 112th Infantry, was engaged in mopping up activities in the Battle of the Marne front that your professor of pharmacy distinguished himself by leading his men to shelter in a cellar retreat. The last man to leave the field, he was literally blown into the shelter, a small fragment fracturing his ankle."

The Rev. A. William Crandell, S. J., Dean of the College of Arts and Sciences, told the students that,—"in Dean McCloskey is an example of the bravery and nobility which we wish to inculcate in each student."

It should be added to Dean McCloskey's record that in the days of peace, he has been just as valiant, heroic, and as

fearless a fighter for higher standards in pharmaceutical education and practice in the interests of better service to his people as he was on the battlefields of France in the defense of human liberty.

On an editorial page Dr. E. A. Brecht outlines a method of recruiting students for pharmacy that deserves a trial on a wide scale. The plan recruits students by an indirect method and for that reason is all the more to be commended. The key man in the plan is the retail druggist who in the grade or in the high school or before women's clubs, service or study clubs, tells a simple story about some phase of drug store service to some phase of community life. At this time any number of fascinating stories, full of romance, can be written about the drugs that are necessary for war service and the part the druggist has in obtaining, collecting, and conserving them. As the spring season approaches, there is the fascinating story of the fight against the insect and the fungus which brings disease and which lessens food production which is necessary, not only to the winning of the war, but for the very existence of men. Someone has said rightly, that the greatest battle line of all time is the insect front where the struggle is between the tremendous productivity of the insect and the intelligence of man. And after that comes the season of allergies and the immunization against disease. All the year round there are the problems that have to do with the health and morale of the community and in this phase of public health work no one occupies a more strategic or important position than the druggist. Dr. Brecht's plan will do more than recruit for pharmacy, it will publicize pharmacy in a dignified way and make him stand out as a community benefactor. Incidentally, it will give him a type of publicity and an amount that he cannot buy with newspaper advertising. The most to be prized feature of the plan is that it makes it possible for the druggist to personalize his work as one which increases the productiveness and improves the moral and physical health of his community. We hope Dr. Becht will continue his work so well begun and give us the results through the pages of the Journal.

When Dr. Hiner sent the paper,—The Kilmer Award Pays Dividends,—by Charles W. Wendt, (see this issue) he accompanied it with the following comment:

"This is the paper by the Kilmer student which I wrote you about in my previous letter. I would like to see it printed if you think it is good. It is his own idea. When I observed the enthusiasm and inspiration this student absorbed at his first national A. Ph. A. convention this thought occurred to me. Those schools of pharmacy and teachers of pharmacognosy who are not encouraging their students to participate in this fine competition are not fulfilling their obligation to pharmacy or their institution. Of course, it takes time and effort, but the students are willing if encouraged, and it is not fair to refuse them the opportunity to try for, and win this splendid honor."

This young man's story of the inspiration he got from his first attendance at the annual meetings is convincing justification for making a great effort to induce many young graduates to attend the national conventions. Unless young men have the contacts soon after their undergraduate days are over. they will rarely become convention minded. This applies to state and regional meetings as well. No greater service could be rendered to pharmacy than to discover a way to bring together at our annual meeting, a group of our best trained and most creative minded graduates. A fellowship would develop which would bring this group back year after year and out of this might emerge a leadership in the various pharmaceutical fields. Mr. Wendt has made some suggestions as to how this might be done and those suggestions are worthy of consideration by student groups, and scholarship societies and fraternity groups and state societies and by moneyed men in the pharmaceutical industries. We commend the student body at Ohio State for its constructive suggestions and this journal will give every assistance it can to carry the idea far and wide to the circumference of the body pharmaceutic.

Ohio State is pregnant with ideas. In a letter to the Editor (see Gleanings from the Editor's Mail), Dean Christensen calls attention to the fact that the publicity pharmacy is getting in Science News Letter is from the pen of Mr. Glenn Sonnedecker, who is one of the News Letter's writers. Mr. Sonnedecker represents the first fruit of Ohio State's experiment of combining pharmacy and courses in journalism. One

of the greatest needs of pharmacy is dignified publicity. No finer service can be performed by a teaching institution than to train young men for this specific field. No finer service can be given than Mr. Sonnedecker is giving pharmacy through the pages of Science News Letter. Incidentally, Ohio State's accomplishment is the strongest argument that can be put forth for leaving the pharmaceutical curriculum sufficiently elastic to make educational experimentation possible. Without experimentation pharmaceutical education cannot progress. Any curriculum that becomes inflexible in an ever changing world is obsolete.

In the morning mail there came a note from pharmacy's ever helpful friend, Director Edward Spease of the National Association of Retail Druggists. From it I quote. "This is just a note to wish you Christmas Greetings and then to add something which crossed my desk this morning and very likely has come to yours. I compiled a little news item which should read something like this,—'Mr. Frank F. Law, a graduate of Temple University School of Pharmacy, member of the University Board of Trustees' and president of John Wyeth & Bros., Inc., was recently elected president of the General Alumni Association of Temple University.' It occurred to me that you might use this item and weave a bit around it about the help that a college of pharmacy can receive if it makes some effort to see that its prominent alumni are occasionally elected to the board of trustees where they can be helpful to the college." What Director Spease has said is true, yet in it there may be an element of danger. In my own institution, a retail druggist, Mr. Stanley Long, is serving his third six year term as a member of the Board of Regents. When he was first elected to the position, Chancellor Lindley, of the University of Kansas, who was a druggist himself, warned me that a druggist even with the best of intentions, on a governing board, might do the college of pharmacy more harm than good. Bearing that in mind, I have through the years made a special effort never to place the regent in an embarrassing position. He has served long and has served well. He has been just as considerate of every other college of the University as has of the college of pharmacy. He has made a good regent and I have learned that a pharmacist on the governing board can render a great service by being on

the board. He does not even have to say anything specific in defense of pharmacy. His presence on that board is a service to the college of pharmacy and to the profession of pharmacy as a whole.

Things that do not make sense:—

(1). The other day I read in the paper a United Press dispatch that said in substance that the Farm Security Administration in the interests of food conservation was advising that we leave no sugar in the bottom of our coffee cups; that we eat the skins of baked potatoes; that we take the bone in our fingers so we can get every bit of meat and that we wipe our plates clean of gravy with a slice of bread. In contrast to this in the same paper was a story about a party at Washington that a high minded philanthropist threw for the wife of a high up politician for forty dollars the plate.

(2). Every paper in the Missouri Valley Country carries columns of notices of farms and farm equipment for sale, all because the farmers cannot get help to run their farms. At the same time there comes over the radio the voice of Virginia's distinguished Senator Byrd, which assures us there are so many people in Washington working for the government that they get in each others road and that the jobs there could be done better if one-third of those on the government payroll were sent home.

(3). The administration rations sugar and other foods and gasoline, all of which are necessary for the fighting man to win the war. On the other hand, there are tons of sugar and food products converted into liquor and fed the fighting man, ad libitum, and this can only lessen his efficiency as a fighting man and is an important factor in the cause and spread of disease.

(4). The Administration is undertaking to control the distribution of food products and gasoline and oil and coal and all the things that are necessary for winning the war, but they cannot control the rationing or distribution of beverage liquor, one of the greatest enemies of self control, good morals and public health.

(5). If General Larry B. McAffee, representing the Surgeon General's office actually said what the papers reported he said before the House Military Affairs Committee that; "Any intelligent boy can read the labels on these drugs and dispense them as needed", then I. a physician, must say "God Save America from Dr. McAffee's brand of science and his brand of medical practice, if that is his conception of the type of service he uses when he deals with the lives of human beings."

(6). Someone in Washington says a shortage of pharmacists has not been proven. If there is no shortage of pharmacists, then why is the Army giving six weeks courses and the Navy ninety day courses to buck privates to qualify (sic!)them for pharmaceutical service in the fighting forces on land and sea? Such a system of education (sic!) is not tolerated for civil practice.

Among the things that Santa Claus brought me for Christmas, was a book,—Inside Latin America by John Gunther. The reading of it has helped to clarify a lot of things in our neighbors to the South, that before has not made sense. I hope his next book will be,—Inside My Own United States. Perhaps he can clarify some of the things that are going on at home that do not make sense.

We are grateful to Dr. George Urdang for the memorial printed on another page in memory of Dr. William H. Weyghant. I feel it a personal loss when a great teacher who has contributed so much to the lives of young men and women passes on, and I did not have the rich experience of knowing him personally. But through his colleagues and his students I share the stimulus of his wholesome, virile influence and shall cherish both his service and his memory.

It was the morning of January eighth, as I sat at my desk, I opened a letter and read this crushing news:

"Leslie W. Rowland, head of the medical textbook division of J. B. Lippincott Company, died on Saturday, January 2, 1943, at his home in Swathmore, Pa., just outside of Philadelphia, after a brief illness.

"Prior to his connection with J. B. Lippincott Company, Mr. Rowland, who was 51, had been promotion manager of the Cincinnati Enquirer. During the Ohio River floods in 1937, Mr. Rowland organized the newspaper trucks to supply the city with drinking water at a time when drinking water was at a premium. Early in his career, he was a reporter for the old Philadelphia Press. After two years in France during World War I, he became advertising manager for the American Express Company where he remained until 1927. He was publicity director for the first world cruise ever attempted by any travel or steamship company. He was publicity director also for the first "Army Show" which was produced by the famous 7th Regiment in New York City during early 1917.

"After funeral services in Philadelphia, interment was in Arlington National Cemetery, Washington, D. C."

Just a month before to the day and hour, I had sat with Mr. Rowland in the Union League in Philadelphia planning with him and his colleagues for a series of texts which he had told me a month before was to be his last great effort and the crowning glory of his career. Leslie W. Rowland was a quiet, modest, kindly, gentle, courteous, considerate, reverential, dig-

nified and courageous man. No adjective denoting the finest qualities of the human soul applied to his personality would be amiss. He wandered around over this country, in and out of offices of educators, scientists, and business men, friends and competitors, and wherever he went he was received with pleasure and respect. He never left an office without leaving behind him something of himself,—hope and cheer and good will. For more than a decade he followed the meetings of the American Association of Colleges of Pharmacy and the American Pharmaceutical Association and in his quiet way gave support to every effort for the improvement of teaching. A convention room will never look the same to me without Mr. Rowland sitting there. His specialty was to see that good books were created and distributed and no man does a finer work than to see that good texts are in the hands of students, and good books are placed in the channels of trade. A brief sketch of his life shows that his dominant characteristic was service to others. The service that such a man renders never ends. For those of us who knew intimately, of his desires and plans, lies the responsibility of carrying on. His memory will be an inspiration to do it. Its completion will be a benediction. Leslie W. Rowland was a great educator. We will share the loneliness with Mrs. Rowland and with her look forward to that time when we shall meet again,—for such is the promise to those who believe. .

Rufus A. Lyman

SCHOLARSHIPS AVAILABLE FOR 1943-44

University of Florida.—One part time scholarship. $450, no non-resident fee.

State University of Iowa.—A half-time scholarship as assistant hospital pharmacist, $950,—no exempton of fees. Two graduate fellowships, $750, and one half-time $450, with partial tuition exemption.

University of Nebraska.—Two part time graduate assistantships, $500, exemption tuition fees.

Washington State College.—Scholarships and awards ranging from $150 to $1,000.

Western Reserve University.—Two freshman scholarships, $150,—two graduate assistantships, $500 with tuition exemption and two graduate tuition scholarships.

University of Wisconsin.—Scholarships and fellowships ranging from $200 to $400 with fee exemptions. Assistantships in teaching and research, $300 to $1,000.

Gleanings from the Editor's Mail

Thank you so much for your American Journal of Pharmaceutical Education which I am delighted to receive. I think you are doing a grand job.

A. J. GOLDFORB, Secretary
December 18, 1942. Society for Experimental Biology and Medicine

In a recent issue of your journal, Va. VI #3 (1942), there appeared two articles on "Pharmacy: The Functional Significance of an Institutional Pattern"; one by Isador Thorner, and the other by George Urdang. I enjoyed these two articles very much and consider them worth keeping. Enclosed find 50c in coin, for which I shall appreciate your forwarding to me a copy of that particular issue.

GEORGE GLAMVILLE,
November, 1942. San Francisco.

Enclosed you will find a money order to cover the cost of a years' subscription to the American Journal of Pharmaceutical Education, also a sufficient amount to cover the cost of the first five volumes at the price quoted in your letter of August 25, 1942.

We all look forward to receiving The American Journal of Pharmaceutical Education and anticipate that they will be of great help to us in our work.

It may be of interest to you to know that we have two Nebraska University pharmacy graduates in our organization, namely, Mr. R. T. High and Mr. Thomas Cady.

S. N. DOWNS, JR.,
Ancon, Canal Zone Secretary
November 3, 1942. The Canal Zone Academy of Pharmacy.

I wish to give vent to my opinions concerning some of the questions which you ask about the Denver meeting. I believe the Denver meeting was the best one held in years—probably due to both the war and the fact that it was streamlined, which did not give the professional politicians an opportunity to attend to all of the details as is possible in our regular sessions, which I believe, are drawn out too long. I think we have become rather careless with regard to the use of our time and would suggest that the A. A. C. P., the A. Ph. A., the Plant Science Seminar and the Research Conference should be taken care of within eight days, Sunday to Sunday, inclusive.

I am disappointed, however, if it is the idea to discontinue the teachers' conferences. I may not be a good example of a teacher using the latest methods, although I have had pedagogical training which many of our science teachers have not had. Even though we do not believe there is a science in teaching, we are apt to forget and become careless in this most important objective of a pharmacy school. I hope we shall return to at least some of the conferences which are particularly useful to the younger teachers and scientists.

I was also disappointed to hear that so few of the teachers in pharmacy schools were subscribers to the Journal. It is a case of poor salesmanship or self egotism on the part of the pharmacy teachers that is at fault? While the plan for an annual meeting is postponed at present, I hope that conditions this coming summer will make our annual meetings possible.

I am now and have been most unusually busy this summer and fall with a P. W. A. research project in connection with our medicinal plant garden and with other war efforts.

C. E. MOLLET,
November 4, 1942. University of Montana.

I was very much interested in your editorial beginning at the bottom of page 599, in the October 1942 issue of the Journal. I was interested in this particularly in view of the fact that one of our 1942 graduates, Glenn Sonnedecker, is employed as a member of the staff of Science Service. Mr. Sonnedecker was one of the young men who has taken some work in journalism in connection with his studies in pharmacy.

I called his attention to your editorial, and in reply he advises that of the nine stories mentioned in your editorial, he has written seven. Most of these were also syndicated nationally to newspapers. He also advises that he has been able to resurrect the classification of Pharmacy in the News Letter. He points out, however, that he, as well as others, has difficulty in placing stories under their proper headings. Some fall naturally under the heading of Pharmacy, others which the pharmacist might consider in his field may also be justly claimed by the chemist, physician, or even the botanist. As a result, in order to play safe, a variety of stories have been dumped into the hopper of public health and medicine. However, he points out that he would like more Pharmacy stories. He feels that it would help him considerably if word could be passed around that there is a pharmacist writer on the staff of Science Service. This should improve and and open up source contacts which could be developed into good Pharmacy stories. If you care to follow this up, I suggest that you write to this young man as follows: Glenn Sonnedecker, 1719 N Street N. W., Washington, D. C.

B. V. CHRISTENSEN,
December 28, 1942 Ohio State University.

Thus far, we have been most fortunate in preserving our student body, as well as our teaching staff, but gradually inroads are being made into both.

I can say, however, and I am free to admit it and to compliment those responsible for it, that the improvement and the extension of the course in Pharmacy to the B. Sc. level has brought much more recognition to us than ever before. It was a job well done, and after the return of normality, we should continue to pay more attention to improving our work.

IVOR GRIFFITH,
December 5, 1942. Philadelphia College of Pharmacy and Science

Notes and News

University of Colorado, College of Pharmacy. —President Robert L. Stearns was recently called to Washington by President Roosevelt to serve on a commitee which studied the effect of the war on educational institutions.—Lieutenant Colonel Charles F. Poe is now stationed in North Africa and is serving in the Quartermaster Corps. He was sent to England last June and accompanied the large convoy of American troops which was sent to North Africa when the offensive was launched in that country.—Prof. Martin Schmidt, who for many years has taught a required commercial pharmacy course, is on leave to assist in business research relating to the railroad industry.—Prof. F. G. Drummond was called to the Army last June.—Because of a shortage of help, Edward C. Christensen and Charles Bloomquist, both senior pharmacy students, are serving as student assistants in pharmacy and chemistry respectively. —A large percentage of the male students of the college of pharmacy are now enrolled in the Navy's V-5 and V-7 programs. Some are enlisted in the Marine Corps Reserve program for students.—Students in the nursing school are taking three courses which are given under the supervision of the college of pharmacy.

University of Connecticut, College of Pharmacy.—Dr. Curtis P. Gladding, former president of the National Association of Retail Druggists and president of the Advisory Board of Trustees of the University of Connecticut College of Pharmacy, was made an honorary member of the Rho Chi Society at exercises held December 21. First Class Pharmacists Mate, Don Capazoli, United States Navy, who was a special guest, spoke on the duties of pharmacists in the naval service.—Six students were initiated into active membership. They were Aaron Anone, Marion Borriello, Wanda Butler, Russel LaRose, Louis Mattie and Marshal Merkin.—Dr. Albert N. Jorgensen, president of the university, addressed the entire student body of the college of pharmacy recently on "The Task of the United States in Winning the War and Establishing Permanent Peace".—Approximately twenty-five students in the colleges have joined the army enlisted reserve. To date but few students have been lost through voluntary enlistments by induction into active military service.

Detroit Institute of Technology, College of Pharmacy and Chemistry. —Prof. Robert Cummings who had his training at the University of Detroit and McGill University, has replaced Dr. H. C. Emmert in the biological science group.—Mr. John Royal has replaced Prof. James D. Russell in the department of chemistry.—Commencement exercises will be held on January 28 for the class which would normally be graduated in June of 1943.—The effect of conscription on enrollment is steadily becoming more acute. Several seniors with less than two semesters work remaining have been drafted and the ranks of lower classes have been hit even harder.—The results of correspondence with graduates in the armed forces regarding their status is far from encouraging. Few

of the graduates received commissions and these mostly in chemical warfare. Many report that the "90-day" Army pharmacists are fulfilling duties which would not be allowed in civilian life.

University of Florida, School of Pharmacy.—Charles R. Jordan, associate director of the Bureau of Professional Relations, has been called for military service. Before leaving, he planned and wrote much of the literature to be mailed out in 1943. The personal contact work that he carried out will necessarily be omitted for some time to come. However, the activities of the Bureau will be continued by improving the quality and content of the literature.—At the autumn initiation banquet of Iota Chapter of Rho Chi, the following new members were initiated: Faye Whitmore, Paul Rosenberg, and Shelton M. Spector.—David Kantor has been appointed full time librarian in the chemistry-pharmacy library.—The University of Florida library has been granted $20,000 by the General Education Board for completing sets of various journals and other purposes. A portion of this sum has been allocated for strictly pharmaceutical journals.—Welda Christie has resigned as secretary to Director P. A. Foote to accept a position with the Navy in Miami. Her place has been taken by Elizabeth Tousey.

The George Washington University, School of Pharmacy.—Prof. Charles W. Bliven, Acting Dean is on leave of absence teaching pharmacy in the Maritime Commission's training school in New York. Miss Helen McDonald has been appointed instructor in pharmacy to assume his teaching load and Dr. L. G. Gramling has been appointed the executive officer of the school.—Prof. Frank Fortunato has entered the Army as First Lieutenant in the Sanitary Corps. Miss Kahleen Darner has been appointed research associate in pharmacology to continue the research he was engaged in.—Miss Emily Godfrey has been appointed research associate in pharmacology to fill a new position created in the school.

The State University of Iowa, College of Pharmacy.—Miss Delpha L. Donner, who has held a fellowship the past calendar year, has taken a position in a retail store. The vacancy will be filled by Miss Carolyn M. Carbee, who will divide her time as laboratory assistant and assistant hospital pharmacist.

Long Island University, Brooklyn College of Pharmacy.—Theodore A. Blackman of the class of 1911 and an active alumnus of the college has established four $100 scholarships.—Recently added to the library of the college was a set of the Encyclopedia Britannica presented by Abraham Kaufman.—Edward Neimeth, chairman of Board of Trustees of the college was elected a member of the Board of Trustees of Long Island University.—Benjamin L. Milana has taken over the teaching responsibilities of Prof. William H. Wegandt who died recently.—A roll of honor has been established for our men in the global war. It consists of individual stars on which are inscribed the names of the men in service, the year of graduation, or his status as a student. These stars are placed around a plaque of our men in the first world war on a wall in the anteroom of the office of the dean.

University of Nebraska, College of Pharmacy.—Mr. Stanley D. Long, a retail druggist who is serving his third six year term as a Regent of the University of Nebraska, has been elected President of the Board of Regents for the coming year.

Rutgers University, New Jersey College of Pharmacy.—The fiftieth anniversary commencement was held on January 6. The commencement address was given by Dr. Morris Fishbein, his subject being:—The Advancement of Pharmaceutical Service. Honorary degrees were conferred upon Morris Fishbein, George D. Beal, Adolph F. Marquier, and Thomas M. Pascall.—Twenty-nine candidates received the Bachelor's degree.—Prizes were awarded as follows: Alumni Graduate, Milton H. Silver; the Hommell, Benjamin A. Mardarello; Athletic, Theodore M. Brady; the Merck Awards, Benjamin A. Mardarello and John J. Dyckmans; Chemistry, Samuel J. Gitow; Pharmacy, Howard M. Silver; the Robert L. Swain American Pharmaceutical Association Membership, Paul M. Ent; New Jersey Pharmaceutical Association Prizes, Henry H. Jakubczak and Frederick T. Morris; Lehn and Fink medal, Howard M. Silver; the McKesson and Robbins, Richard E. Belz; the Frederick H. Erbacher, Ruth D. Zorilla; the William O. Kuebler, Frederick T. Morris; the New Jersey Wholesale Drug Prize, Elizabeth V. Crawford; and the Italian-American Pharmaceutical Association, Alvin Felmeister.—In addition Mr. Vreeland, chairman of the Trustee-Advisory committee, and Dr. Frank B. Meeker, Financial Secretary of the college were awarded Rutgers Medals because of their service to the institution.

Ohio Northern University, College of Pharmacy—The Ohio Northern University Pharmaceutical Association, which was founded in 1905, is at the present time making application to the American Pharmaceutical Association to become a Student Branch of that organization.—Mr. M. L. Neuroth recently resigned his position as instructor in pharmacy to accept a Lilly Fellowship at Purdue University in order to continue graduate work.—Phyllis June Scholl, a recent graduate of Purdue has been employed as instructor in pharmacy.—The hard-boiled attitude taken by some of our Selective Service boards is beginning to have effect on our student population. Several have recently been called to the Army.

University of Oklahoma.—Dr. Ralph Bienfang has been elected a member of the executive committee of the Division of Biological and Earth Sciences of the University College.—A one hour a week course in military pharmacy will be offered by Dean Johnson the second semester.

Oregon State College, School of Pharmacy.—Theodore N. Morris, senior pharmacy student has been appointed cadet colonel of the R. O. T. C. at Oregon State College. Other pharmacy students receiving R. O. T.C. appointments are: cadet captain, infantry, Dean E. Jackson; cadet captains, field artillery, Pierre D. Mead and Howard W. Kriz; cadet first lieutenants, infantry, Michael L. May and Richard A. Flye.—The three pharmaceutical societies, Lambda Kappa Sigma, Kappa Psi, and Rho Chi met jointly for their annual banquet. Presidents of the organiza-

tions introduced pledges and members of their respective oganizations. Honored guests included Dean and Mrs. Ziefle, Dr. and Mrs. L. C. Britt, Prof's. Ernest Stuhr and Frank R. Henry.—Senior students devoted several afternoons at the Corvallis Red Cross center preparing surgical dressings.—Dr. L. C. Britt, associate professor of pharmacy has been elected treasurer of the local chapter of Sigma Xi.

Philadelphia College of Pharmacy and Science.—The most recent report of the Committee on the Professional Training of Chemists of the American Chemical Society lists this institution among the 125 educational institutions in the United States deemed by the committee to be qualified to offer professional training for chemists.

Purdue University, School of Pharmacy.—The intensive five day course in operative X-ray technique given by instructors of the General Electric X-Ray Corporation in cooperation with the School of Pharmacy was attended by nineteen technicians and students.—At the commencement exercises held December 20, twenty-eight students received the bachelor's degree. Two graduate students, Herbert W. Murphy and Gene W. Johnston received the doctorate. Six pharmacy graduates were granted certificates of proficiency in military science tactics and were commissioned as second lieutenants with the Officers Reserve Corps.—Gloria Niemeyer, B.S. in pharmacy, 1942, has been appointed assistant instructor in pharmacy.—Lt. Bergo of the U. S. Naval Training Station at Purdue recently discussed the use of sulfa drugs in naval medicine before the student branch of the American Pharmaceutical Association.—Charles Jordan, 1935, who has been doing extension work at the University of Florida is visiting his mother, Mrs. C. B. Jordan while awaiting asignment in the Chemical Warfare Service. Mrs. Jordan recently visited her other son, Capt. R. E. Jordan, who is an instructor stationed at the air base school at Lincoln, Nebraska.

St. Louis College of Pharmacy.—Prof. A. F. Schlichting has been made dean to succeed the late Dean Charles E. Caspari.—Prof. Walter Fredell has resigned to accept a teaching position at Drake University college of Pharmacy.—Dr. Harold Jeskey a former instructor in chemistry and now a member of the faculty of the University of Tennessee school of pharmacy, visited the school and spent the holidays with Dean Schlichting.—Prof. N. M. Ferguson, who received the degree of Doctor of Philosophy last June from the University of Washington, has been advanced to the rank of full professor of botany and pharmacognosy.—Twelve students have been lost through the draft within the last eight months, and thirty more are entered in the reserve corps.—The accelerated program appears to be well received here and the grade of work done by the students much better than under the old plan.—The alumni bulletin appeared for the first time last July and is being favorably received.

Medical College of The State of South Carolina, Department of Pharmacy.—Dr. W. A. Prout, acting director of the school of pharmacy has announced the establishment of a scholarship by Andrew J. Greer of the

Greer Drug Company. This scholarship amounts to $1,000 in cash. It is offered to the most worthy and needy student who cannot without financial aid, enter upon the study of pharmacy without assistance. The scholarship is to be divided into annual payments of $250 during the four year course. The award is made by vote of the executive committee of the South Carolina Pharmaceutical Association.—Plans are underway for the transfer of the school's model drug store, now located on Lucas street, to the new medical and pharmacy building. When this transfer is completed all branches of the department of pharmacy will be located in the south wing of the new building.—Dr. Rhett G. Harris of the department of bacteriology has recently received a commission as Captain. He is now somewhere in the South Pacific. His place on the faculty was taken by Dr. Raymond Young, formerly of the Yale faculty. —Dr. Robert P. Walton, formerly of the University of Mississippi has been appointed chairman and professor of pharmacology to succeed Dr. W. H. Zeigler, deceased.—Dr. Morris Belkin of Yale succeeds Dr. Stoneburg in the department of pharmacology.—James R. Adams has returned from the University of Florida where he completed requirements for the masters degree.—J. Dorsey Booth, instructor in the department of commercial pharmacy has resigned to accept a position with the Schering Corporation of Atlanta.

Western Reserve University, School of Pharmacy.—We have had no particular reactions to the accelerated program but are having some difficulty in synchronizing strictly pharmacy courses with those offered in other schools or departments of the University in the summer, because at that time, a year of work in certain subjects will be concentrated in two eight week sessions.—Dr. Donald Cook is supplementing his lectures in physiology and immunology by the presentation of movies relating to these subjects. The films obtained from universities or pharmaceutical manufacturing concerns are excellent and the students have shown considerable interest in this type of instruction.—During the Christmas vacation extensive repairing and redecoration has been done in the pharmacy building.

University of Toledo, College of Pharmacy.—Dean George L. Baker has gone to San Diego to serve in the Navy.—Mrs. Bess G. Emch has been named acting dean in his place.—Dr. Kenneth Redman has left to join the faculty of the School of Pharmacy of the North Dakota State College at Fargo.—Mr. Anthony S. Ridolfo of Ohio State University, has been added to the faculty.

State College of Washington, School of Pharmacy.—The registration of sixteen women in the freshman class brought the number of women enrolled to over 30 per cent.—Mr. Charles Martin has been appointed instructor in pharmacy to fill the vacancy caused by the resignation of Dr. R. L. McMurray.—Dr. Haakon Bang has been elected secretary of the local chapter of the American Association of University Professors.— Mr. Hugh C. Vincent, instructor in pharmacy, is on leave of absence for graduate work at Purdue University, School of Pharmacy.—Several attractive graduate scholarships are available at the beginning of the

second semester, February, 1943.—In a special war year program designed to educate students majoring in the arts, social sciences, and humanities in civilian war skills, the faculty of the school is offering a popular course in household remedies.

AID FOR PHARMACY

Pharmacy is in need of aid; and this aid must come from those who know and appreciate its value to humanity. It must come now to its schools, else pharmacy may dry up at the source. Many schools of pharmacy are in sore need of funds, and especially so because of the present emergency. Many of them undoubtedly will be closed unless help comes.

The instances have been rare where one who has made considerable fortune in the field of pharmacy has used this fortune, or any considerable part of it, to perpetuate the profession of which he is a member.

Probably it may appear to the successful person that he receives more adulation and credit for making large gifts to some form of medical research, or that the giving of buildings to universities for scientific endeavors other than pharmaceutical, will bring more appreciation to him for his generous behavior. Pharmaceutical education and research may not appear to be as spectacular as the investigation of a disease. It would seem, in the case of those whose vast fortunes have been amassed from the field of pharmacy, or have been built up largely by efforts of retail druggists, that they might consider what has made their fortunes possible and make some large gifts in grateful appreciation therefor.

The lack of appreciation of the need for pharmacists in the armed forces, and the ninety-day schools set up to prepare technicians to furnish the kind of pharmacy that some medical leaders think is sufficient, will prove of incalculable harm to our time-honored profession unless its friends come to the rescue.

University schools of pharmacy, particularly, should make an effort to draw prominent and successful alumni into their university board of trustees and alumni associations, as some have already done, in order that they may be present to speak for pharmacy when the opportunity presents itself.—from N. A. R. D. Journal—February 1, 1943

Medical College of Virginia, School of Pharmacy.—In an effort to interest more girls in the study of pharmacy, several scholarships for girl high school graduates are being offered. These scholarships are made possible through grants from wholesale houses and manufacturers located in Virginia. We are grateful to them for their help in this matter, and plan to announce the details about their awards in the near future.—W. G. Tarrant, Jr., instructor in commercial pharmacy has received a commission as Lt. (jg) in the Navy, and will report for duty on February 3.—In keeping with Army and Navy suggestions we have begun compulsory physical education courses for all four classes.

Miscellaneous Items of Interest

A Memorial

WILLIAM H. WEYGANDT

When the sad news of the death of Dr. William H. Weygandt reached me, it seemed to me unbelievable. Could that be? Was it possible that life as such resigned the further representation through one of its most excellent propagandists? For that it was. To William H. Weygandt, life as such, this sweet custom of breathing and eating and drinking and teaching and—last but not least—talking, had quite a special, an almost mysterious value.

It was not the one or the other thing that he liked most. It was not even the total sum of them. It was his arranging all these enjoyable exressions of life, the particular smack he got out of them. It was, in short, the game of life that he loved and to which he devoted himself with every fiber of his body and with every impulse of his soul.

Naturally, taking life as a game, William H. Weygandt had a very definite concept of the rules of this game. He respected them meticulously—and he expected others to respect them. He was an epicurean, but a sensitive one. He had to protect himself against anyone who did not know or did not respect his rules of the game. His weapon was irony and he mastered it.

That is the stuff artists are made of and those teachers whose success in teaching originates from their artistic inclinations. William H. Weygandt was an excellent teacher. Without taking the trouble of own research, he knew his field expertly. That would have sufficed to convey the knowledge concerned. But Weygandt did more. He entertained the students in his lectures. His arrangements of the material was clear, his performance vivid and personal. It was not simply pharmacognosy, it was his, it was W. H. Weygandt's concept of pharmacognosy that he offered to his students and that made listening to him an inspiration.

To his rules of the game of life belonged the conviction that every participant in this game was entitled to the full equivalent of his contribution. That determined Weygandt's attitude to his students. Everybody was given the same care and attention. There was nobody who could say that he was favored. There was nobody who could say that he was neglected. In his unforgettable quizzes an elaborate system must have worked making it possible to check on everybody just when he needed this check most.

Weygandt liked informality. However, he knew that informality requires good manners as its indispensable presupposition. He hated this specific brand of noisy toughness which claims to be identical with informality while, in fact, it is nothing but lack or defiance of good

manners. He wanted his students to learn not only how to deal with drugs but how to deal with people. He wanted them to leave the Brooklyn College of Pharmacy not only as full fledged pharmacists but also as perfect gentlemen. His irony, and sometimes even his wrath, was directed primarily against the violators of his ideas of behavior.

Now he is gone. For the world at large an elderly gentleman has left the scene whom the limelight of publicity has never caught. For us who knew him, the decease of William H. Weygandt means the loss of a friend, and it means simultaneously another monument erected in the hall of memory that everyone of us harbors in his heart.

George Urdang,
University of Wisconsin

Dr. Urdang Delivers Series of Lectures at Ohio State

Dr. George Urdang, Director of the American Institute of the History of Pharmacy, spent the week of November 16, 1942, on the campus of The Ohio State University, delivering a series of lectures on the History of Pharmacy. To indicate the nature of the lectures and the schedule, the week's program is given herewith:

Monday, November 16, at 11 A. M. "The Pharmaceutico-Historical Movement"

Monday, November 16, at 4 P. M. "The Early Days of American Pharmacy"

Tuesday, November 17, at 1 P. M. "Pharmaceutical Ethics"

Wednesday, November 18, at 9 A. M. "The Regulations Concerning the Practice of Pharmacy in Europe and the United States"

Wednesday, November 18, at 4 P. M. "The Two-hundredth Anniversary of the birth of Carl Wilhelm Scheele"

Wednesday, November 18, at 8 P. M. "The Pharmacist as the Nucleus of the Drug Industry"

Thursday, November 19, at 1 P. M. "Research in History of Pharmacy"

Thursday, November 19, at 4 P. M. "Research in History of Science"

The students of the College and the many campus friends and visitors were thoroughly impressed and pleased with the excellent presentations and scholarly addresses. The Quarterly Journal published by the Junior A. Ph. A. of Ohio State appropriately reviews the series as follows:

"Dr. Urdang, Director of the American Institute of the History of Pharmacy, spent the week of November 16th at Ohio State. We just adopted him for one of the most enjoyable series of lectures it has been our good fortune to hear. Dr. Urdang met our classes and talked right down to earth history of pharmacy and pharmaceutical ethics, and the students loved it. The Juniors and Seniors found out who was responsible for this pharmacy profession we are studying to follow and uphold in a lecture on "The Pharmaceutico-Historical Movement". The freshmen and sophomores had a glimpse at the "Practice of Pharmacy in Europe and the United States", and the Doctor encored at their request with "Ethics of the Pharmacist". The whole college then assembled to hear about "The Early Days of American Pharmacy". The graduate students had their turn to, so they stole him away for a right good informal visit.

"Other departments on the campus likewise had an opportunity of hearing Dr. Urdang at his best as he reviewed "The Life of Carl Wilhelm Scheele" on the occasion of the two-hundredth anniversary of the birth of this world famous pharmacist. Completing his series of talks the following day, the History Department heard a stimulating address on "Research in the History of Science".

"The occasion of the visit of this fine gentleman and scholar to the Ohio State campus discovered for us a new sense of pride in what our profession is made of, and for Dr. Urdang a host of new friends. May we recommend to the other Colleges of Pharmacy that you too take advantage of the opportunity to invite Dr. Urdang to your school."

L. David Hiner.

Presentation of Honorary Membership in Rho Chi to Dr. Curtis P. Gladding

In these days when the forces of destruction are wreaking devastation over the land, we sometimes are prompted, like Isaias of old, to cry out "How long, O Lord?" yet fear, perhaps, lest once again the answer come final and terrible,—"Until the cities be wasted without inhabitant, the houses without man, and the land be left desolate". At this time, however, there is hope, for we stand at the eve of a Promise. Nineteen hundred and forty-two years ago there came into the world one whose birth was heralded by an angelic choir singing Peace—"Peace on earth to men of good will". And the shepherds, like many of us today, were afraid. Then an angel spoke: "Fear not; for I bring you tidings of great joy that shall be to all the people, for this day is born to you a Savior who is Christ the Lord, in the City of David".

It was indeed unusual, but all the world was at peace on that first Christmas morning. Nineteen hundred years have come and gone since that memorable day in Bethlehem. At times the world has known peace; often the bungling of man in his stupidity has plunged nations into war and brought suffering on their people but through it all, it has been a belief in God and faith in the principles of Christianity that have given us all that is finest in our civilization of the West. Today, as never before, we need to turn to the King of Kings and ask that He once more restore peace to the world and unity among men.

When the Wise Men of the East learned of the birth of the Savior they journeyed to Bethlehem, bearing rare gifts of gold, frankincense, and myrrh. Today, like the Wise Men, we honor with gifts those whom we esteem.

Tonight, it is fitting that the Rho Chi Society bestow a recognition of appreciation upon Dr. Curtis P. Gladding whose belief and faith and trust in God and whose practice of Christian principles have made him a man among men.

It is not often that the Rho Chi Society confers honorary membership upon men in pharmacy; it is rare, indeed, that such an act honors the Society rather than the Society honoring the man. Last summer, at the proposal of Alpha Gamma Chapter, the National Executive Committee elected Dr. Gladding an honorary member of the Society.

Dr. Gladding, during his long life, has seen many changes in pharmacy, in men, and in the world, and while he has adapted himself to these changes, he has not allowed them to change him. He is still the same Dr. Gladding as of old, sincere, honest, courageous, calm, whose very presence bespeaks dignity and inspires confidence.

Dr. Gladding is a pharmacist, he respects pharmacy, he practices pharmacy. The College of Pharmacy is dear to his heart. He was with the College when it was born; he has nursed it through days of anxiety; he has prayed that it might serve to the fullest the purpose for which it was founded, and then, while it was yet a youthful institution, turned it trustingly, like a parent who parts with a child, to the University of Connecticut for adoption.

Dr. Gladding, it is with a feeling of great honor that I present you with this certificate of honorary membership and a gold key of the Rho Chi Society. May your presence be an inspiration to us who are to carry on its work; may we all cherish your association among us. I look forward to the day when the University of Connecticut will erect a building on the campus at Storrs, and I hope that that building may be dedicated the Curtis P. Gladding Hall of Pharmacy.

With these words I welcome you to Rho Chi. May God Bless you and keep you always. and direct your feet in the way of peace.

Leslie B. Barrett,
University of Connecticut.

A Letter from the Chairman of the Executive Committee

Ever since the Denver meeting, the Chairman has hoped that he would have something encouraging to report to you either directly or through the pages of the Journal. The fact remains that to-date he has not had very much news that would be encouraging to the pharmaceutical educators and, therefore, has refrained from wasting paper and throwing ink uselessly. There are, however, several matters which I would like to discuss with you at this time.

On November 12, 1942, comparative fall term enrollments in A. A.-C. P. schools for 1941-42 and 1942-43 (six member-schools not replying) were sent to all member-schools. You will recall that these data showed a decrease of 17.23 per cent in the enrollment for 1942-43 over the figures covering the same period for 1941-42. Since that time, all schools have reported The totals given for men students enrolled during the fall terms for 1941-42 and 1942-43 are given below. You will note that the change in the percentage decrease in enrollments for 1942-43 over 1941-42 has been reduced from 17.23 to 16.73.

	1942-42	1942-43
Freshmen	1760	1441
Sophomores	1800	1247
Juniors	1726	1299
Seniors	1550	1482
Special	95	70
Graduate	198	119
Total	7129	5658

Decrease—16.73%

On December 16, 1942, I sent you a postcard giving a summary of the cancellations of registrations by men students during the month of November. Since that time, the reports from two additional schools have been received. Therefore, these figures show that 163 men cancelled their registrations during the month of November. This is 2.88 per cent of the total fall men student enrollment of 5658. It is interesting to note that only 11 juniors and seniors were drafted and 16 of them enlisted. 19 freshman and sophomore students were drafted during November and 76 of them enlisted, most of them in the Navy. This large number of enlistments among freshman and sophomore students may possibly be explained by the feeling of uncertainty prevailing among freshman and sophomore students. The total number of students in all classes drafted during the month of November was slightly more than one-half of one per cent of the total number of men enrolled in the colleges of pharmacy.

About the first of February you will receive a form covering second-quarter or second-semester enrollments for 1941-42 and 1942-43. It will be greatly appreciated if these forms will be filled in promptly and

returned to my office. By the time these are received, you will have returned the postcards containing the data covering cancellations of registrations during the month of December. These data will be compiled and sent you for your information.

At the time of this writing, the Chairman of the Executive Committee has not received any authentic information regarding the return of drafted 18- and 19-year olds to the colleges for further training in pharmacy nor has he received any authentic information as to the further deferment of students in our colleges. A decision by the War Manpower Commission is expected every day and no doubt by the time you read this communication, you will know the facts.

At the time that accelerated courses of all kinds, including Pharmacy, were initiated, many educators expressed great doubt as to the quality of graduates that would result by such concentrated training. Many of them felt that students have an educational absorption coefficient beyond which they could not extend themselves without lowering their educational accomplishment. Now that we have experienced one summer quarter or term upon the accelerated basis, it is possible to determine whether the students did as good work during this summer term as they did during other terms of an academic year. Several of our member-colleges have attempted to make this comparison and in general these studies show accomplishment records approximately 15 per cent less than that attained during quarters or semesters included in other academic years. It would not only be interesting but also might be a contribution to pharmaceutical education if all the faculties of member-colleges would make such comparisons and send the results to my office. These will be compiled and sent to all of the schools for the information they contain.

Charles H. Rogers, Chairman.

Rules of the Illinois Board*

1. The new official standards become official November 1, 1942.
2. Until August 1944, questions asked will be based upon drugs, remedies and preparations common to both U. S. P. XI and XII and N. F. VI and VII. Except an occasional question which will elicit the fact that the candidates know there are new standards in effect as of November 1, 1942. In as much as applicants during 1942-43 and to August 1944, will be those who in the main have studied on U. S. P. XI and N. F. VI, it seems only fair and reasonable that questions be based on drugs and preparations found in both sets of standards.

*These rules were adopted by the Illinois board October 26, 1942 for their guidance in the allocation of questions and rules to be followed during the transition period from the old to the new official standards. They will be of general interest.—A. Lee Adams, Chairman.

3. It will be permissible to ask questions based on the new standards, —especially on the registered pharmacist examination, about drugs pretty well established through the N. N. R. or by commercial exploitation, such as Insulin.

4. Synonyms should be those current in the U. S. P. and N. F. and not obsolete ones long since discarded.
   Comment.—To the members of this board, all of whom studied on earlier revisions and editions—Spirit of Mindererus is as common a synonym as Epsom Salt, but this synonym was not in U. S. P. XI nor is it in N. F. VII to which Liquor Ammonii Acetatis has been transferred. Therefore we deem it inappropriate to ask a candidate for a synonym long since discarded.

5. The board deems it advisable to emphasize to the candidates and through them to others who may be concerned, that the Official Standards are the books which a candidate should thoroughly know and if he knows these he is considered competent so far as these standards are usable in an examination.

   Comment.—Let us not waste our time on trivia. Let us remember and do not forget that we are of the earlier generation,—that the drugs which were important in our time have gone to the "ash can" long since and have been superceded by newer and better remedies. The lap-robe of the early cutter has been replaced by the auto heater.

6. There has been a good deal of agitation for cutting out the written examination entirely and permitting the candidate's diploma to answer for his theoretical knowledge. We believe that the examining boards are still a necessary protection to the public for whose safety boards were created. To exempt graduates from the theoretical part of an examination would place a great temptation on faculty members. We believe that boards of pharmacy whose members are in constant contact with the public are in a better position to judge of qualifications of a candidate than those whose contact is exclusively with students. Now if the board of pharmacy is to retain its prestige with educators, examinees and the public, the quality of its examinations as reflected in its questions must command respect.

7. If a question relates to some aspect of pharmacy not covered by the official standards, let it be such a question that any man taught in any standard school or using any standard text would have a fair chance of knowing.

   Comment.—Any question or any matter that might be found exclusively in Snow's essentials, Remington, Caspari, Fiero's Review, Blome and Stocking, Arny or other standard book but not common to all should be excluded.

8. The examiners agree to avoid over-lapping of each others subjects. It is understood that there are borderline cases in which it is difficult to tell where one subject begins and another ends.

Each subject is broad enough in its own right to afford full latitude for any examiner's purpose. If there is honest doubt as to what topic belongs in one section or in another—a friendly conference on the part of the two examiners involved will usually settle the matter and the irritation that might arise from infringement will be avoided.

9. Certain principles may serve as a guide: (a) An examiner in materia medica will not ask questions involving doses, symptoms of poisoning or treatment, nor questions involving pharmaceutical jurisprudence. (b) An examiner on toxicology, posology and jurisprudence will not give problems involving arithmetical calculations. For example, he may ask for the dose of a given drug that would be administered to a 6 year old, but he will not supply the adult dose. That should be left to the candidate's own method. If the answer is the correct one, then credit should be given.
10. To ask on an examination in pharmacy how sodium or phosphorus should be preserved is clearly an invasion of the field of chemistry.
11. For the chemistry examiner to ask for the chemical reactions involved, for example, when common salt is used as an antidote for silver salts is an intrusion into the field of the examiner in toxicology.

General.—(a) Obscure, trivial and "double meaning" questions should be avoided. (b) Do not ask for a dose of a drug unless there is actually a dose for such a drug. To ask doses, for example, of cinnamon, salicylic acid, alum, benzoin, wild cherry, squill, etc., when the U. S. P. provides no dose is a waste of useful time and opportunity when there are drugs like sulfanilimide, ascorbic acid, arsenic trioxide, strychnine sulfate, atroprine, etc., the doses of which should be known and an ignorance of which may result in a catastrophe.

13. In asking for storage or preservation of drugs and for warnings in the U. S. P. or N. F., the examiner should make certain of the requirements of the current U. S. P. or N. F. and not take the version of some book on pharmacy which may be based on previous issues of the official standards or upon the author's own idea of what is the best method of storage.

The board also recommends that the department, through its law enforcement division, continue to keep its inspection work on the highest level of efficiency, for the good of pharmacy and the protection of public health.

New Books

Drug Topics Price Book for 1942-1943. 430 pages. Topics Publishing Company, Inc. Price $3.00.

The Annual Price Book contains in addition to a complete price list of drugs, chemicals and preparations, which is in itself a very much worth while effort, much material that is of great value to the druggist who is crowded for time and the subject matter is arranged in a most accessible form. The reference section with the essential laws that concern the druggist, essential facts about the newer drugs, vitamins and animal products, price rules, methods of detailing and many other facts that the druggist must meet in everyday practice. The veterinary pages contain a large amount of material which will help the druggist to service the stock and pet raisers and the whole veterinary clientele. Addresses of reliable manufacturers and distributors are given, and where and how to buy advantageously is discussed. It would seem to the writer that the Price Book would be of value in the colleges, at least as a supplementary text for those teachers who deal with commercial subjects.

R. A. L.

Detailing by Druggists—by Tom Jones. A supplement to the book "Detailing the Physician" by the same author. 1942. 52 pages. Romaine Pierson Publishers, Inc. Price 75 cents.

As the author says, the supplement has been written to show the druggist how to apply practically, the information in the original book to improve his own prescription business.

R. A. L.

An Introduction to Materia and Pharmacology—by Hugh Alister McGuigan, Ph. D., M. D., Professor of Materia Medica, Pharmacology and Therapeutics, University of Illinois, College of Medicine, Chicago, and Elsie E. Krug, B. S., R. N., Science Instructor, St. Mary's School of Nursing, Rochester, Minn., Third Edition, 1942. 779 pages. 46 illustrations and 37 colored plates. C. V. Mosby Company. Price $3.50.

The second edition of this book was reviewed in this Journal in 1940 (page 650). In the present edition the authors have included the advances in the major fields of the past two years, notably in the fields of chemotherapy, vitamins and horomones; many recent references have been added and frequent references to the monumental work of Goodman and Gilman is made. By omitting some chapters on the chemistry of compounds or incorporating them into other chapters, and by relegating many structural formulas to the chemistry textbooks, the new edition has been made nearly a hundred pages shorter than its predecessor. In addition to bringing the most recent advances, some forms of therapy have been elaborated upon and the book again contains a series of excellent illustrations pertaining to hospital technique of administering drugs; also, the suggestions for study and re-

view at the end of some of the early chapters have been written with the aim in mind of impressing upon the neophyte in nursing that her position is one of great responsibility, and, as discussed in Chapter I, it is important, right at the bedside, to become acquainted with the usual responses of patients to the commonly used drugs as well as to learn to recognize early symtoms of overdosage. The relation of the general care of the patient to the drug action is also emphasized, such as control of water intake with urinary anticeptics, carefully planned diets with insulin and need of bed rest with digitalis. Of course, the important share a nurse has in preventing abuse of the use of drugs, especially those that may lead to addiction, is given due prominence.

In the new edition better correlation of the relation between the drug action and the diseased condition in question has been attempted successfully, and the beginner is greatly benefitted by the clearly presented descriptions of pharmacological topics, such as materia medica, actions, toxicology and therapeutic uses, without being overburdened with details of animal experiments; only when it seems especially important are concise references made to use of animals in the development of a new drug, in the assay of important medicines or in comparison of effects on man. This whole treatment of pharmacology, including also the series of beautiful plates of common medicinal plants from Jackson's Experimental Pharmacology and a glossary at the end of the book, would help any practising pharmacist to keep up with the rapid strides in the use of drugs. Inasmuch as the new edition appeared in the year that the U. S. P. XII came out, it would have been an advantage to include the U. S. P. names for some of the drugs, such as tribromoethanol for tribromethyl alcohol and quinacrine for atebrin; the same holds for the Council accepted name of phenytoin sodium for dilantin. It would also help the reader to have pointed out the extensive use of the analysis of blood or urine for alcohol in relation to convictions of drivers who were intoxicated preceding an automobile accident.

H. G. O. H.

Science in War—Edited by L. F. Tice—Volume XIV—Popular Science Talks. 1942. Pages 97. Illustrated. Philadelphia College of Pharmacy and Science.

This little book is a series of lectures on scientific subjects that have a bearing upon the war that were delivered by the members of the staff in the spring of 1942 and is a part of the effort that institution has made through the years to popularize for the public the objectives and results of scientific research. This is a worthy task and if it were carried out more extensively by those engaged in all fields of research, it would result in a finer support of both research and educational institutions by the taxpaying and endowing public.

R. A. L.

Lobscows—by Ivor Griffith, President of the Philadelphia College of Pharmacy and Science. 1939. 548 pages. Illustrated. International Publishing Co. Philadelphia. Price $3.00.

A fascinating book. An apology is offered for this late notice—one cannot get to everything. The volume, from the dedicatory page to the final Ex-Libris, exudes the personality of Ivor Griffith. The author in his inimitable style writes upon many subjects in many scientific fields having always as his objective the elucidation of scientific facts for the benefit of the layman. But he has done more than that, he has written a book, perhaps without realizing is and without intending to do so, on pedagogical methods from which all of us may glean a wealth of information on how we can become better teachers. This type of book deserves a place in our pharmacy libraries because it is a pharmacist's contribution to the general education of society as a whole and it deserves a place in every public library because it is from this kind of writing that the layman gets his knowledge of scientific work and accomplishment and leads him to appreciate and support scientific work and investigation. Lobscows is a real contribution to the pharmaceutical literature of our day. Chancellor C. S. Boucher of the University of Nebraska who is a historian and an ardent supporter of both the dissemination of scientific knowledge and of research recently said it was from just such books that he, a layman, gets his knowledge of science. At the moment he was speaking of "The Human Body", by Logan Clendenning, who has a style all his own. Dr. Clendenning's books are read widely and enthusiastically by the medical profession not because of what he says, but because of the way he says it. May Dr. Griffith continue to interpret scientific facts in a language the public understands!

R. A. L.

Massachusetts College of Pharmacy.—The registration of senior and junior students is about normal, the freshman class is 25 per cent below normal, and the sophomore 50 per cent. The decrease in lower classes is due almost wholly to volunteering for the armed forces, comparatively few having been called through Selective Service.—A substantial number of junior and senior students are enlisted in the various reserve corps of the Navy, the Candidates' Class for Commission of the Marine Corps, and the Army Air Forces. Four seniors have been called to active duty.—After approximately one year of operation of the accelerated program, the faculty and students are in agreement with President Compton of the Massachusetts Institute of Technology in his recent statement regarding accelerated curricula. He stated that, however desirable and necessary it may be to accelerate courses during the present emergency, the ending of the war should be followed by an immediate deceleration of the curriculum until the pre-war schedule is attained. Faculty and students alike, deplore the suggestions, now arising from certain quarters, that the present accelerated program be made permanent in our colleges and universities.

INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

New Jersey
Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark. George Little, Dean (1926)

New York
University of Buffalo, School of Pharmacy, Buffalo. A. E. Lemke, Dean (1939)

Columbia University, College of Pharmacy of the City of New York, New York. Charles W. Ballard, Dean (1889)

Fordham University, College of Pharmacy, New York. Charles J. Lynch, Acting Dean (1949)

Long Island University, Brooklyn College of Pharmacy, Brooklyn. Hugo H. Schaefer, Dean (1939)

North Carolina
University of North Carolina, School of Pharmacy, Chapel Hill. J. Grover Beard, Dean (1917)

North Dakota
North Dakota Agricultural College, School of Pharmacy, Fargo. William P. Sudro, Dean (1922)

Ohio
Ohio Northern University, College of Pharmacy, Ada. Rudolph H. Blake, Dean (1926)

Ohio State University, College of Pharmacy, Columbus. Bernard V. Christensen, Dean (1900)

University of Toledo, College of Pharmacy, Toledo. George L. Baker, Dean (1941)

Western Reserve University, School of Pharmacy, Cleveland. Edward R. Davy, Acting Dean (1902)

Oklahoma
University of Oklahoma, School of Pharmacy, Norman. David M. Johnson, Dean (1906)

Oregon
Oregon State College, School of Pharmacy, Corvallis. Adolph Ernst, Dean (1916)

Pennsylvania
Duquesne University, School of Pharmacy, Pittsburgh. Hugh C. Muldoon, Dean (1927)

Philadelphia College of Pharmacy and Science, Philadelphia. Tom Scott, Dean (1900)

Temple University, School of Pharmacy, Philadelphia. E. Mont Reed, Dean (1928)

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh. C. Leonard O'Connell, Dean (1900)

Philippines
University of the Philippines, College of Pharmacy, Manila. Mariano V. del Rosario, Dean (1917)

Puerto Rico
University of Puerto Rico, College of Pharmacy, Rio Piedras. Luis Torres-Diaz, Dean (1950)

Rhode Island
Rhode Island College of Pharmacy and Allied Sciences, Providence. W. Henry Rivard, Dean (1934)

South Carolina
Medical College of the State of South Carolina, Charleston. Robert Wilson, Jr. Dean, School of Pharmacy, William F. Prout, Acting Director (1940)

University of South Carolina, School of Pharmacy, Columbia. Emory T. Motley, Dean (1928)

South Dakota
South Dakota State College, Division of Pharmacy, Brookings. Floyd J. LeBlanc, Dean (1900)

Tennessee
University of Tennessee, School of Pharmacy, Memphis. Robert L. Crowe, Dean (1914)

Texas
University of Texas, College of Pharmacy, Austin. William E. Gidley, Dean (1926)

Virginia
Medical College of Virginia, School of Pharmacy, Richmond. Wortley F. Rudd, Dean (1908)

Washington
State College of Washington, School of Pharmacy, Pullman. Pearl E. Dirstine, Dean (1918)

University of Washington, College of Pharmacy, Seattle. Forest J. Goodrich, Dean (1905)

West Virginia
West Virginia University, College of Pharmacy, Morgantown. J. Lester Hayman, Director (1920)

Wisconsin
University of Wisconsin, School of Pharmacy, Madison. Arthur H. Uhl, Director (1909)